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A BIBLIOGRAPHY OF
AMERICAN NATURAL HISTORY
VOL. III

A Bibliography of American Natural History

The Pioneer Century, 1769-1865

*The Rôle Played by the Scientific Societies; Scientific Journals; Natural
History Museums and Botanic Gardens; State Geological and
Natural History Surveys; Federal Exploring Expeditions*
IN THE RISE AND PROGRESS OF AMERICAN BOTANY, GEOL-
OGY, MINERALOGY, PALEONTOLOGY AND ZOOLOGY

BY

MAX MEISEL, B.S., B.L.S.

Formerly of the Science Division, N. Y. Public Library

VOLUME III

The Institutions Founded or Organized between 1845 and
1865. Bibliography of Books. Chronological Tables.
Index of Authors & Institutions. Addenda to Volume I.

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To
DR. JOHN HENDLEY BARNHART
BIBLIOGRAPHER, N. Y. BOTANICAL GARDEN

The present generation finds itself the heir of a vast patrimony of science, and it must needs concern us to know, the steps by which these possessions were acquired and the documents by which they are secured to us and our heirs forever.

WILLIAM WHEWELL.

PREFACE

A detailed outline of the scope and plan of this volume is given in the preface to the first volume. The present volume continues with the bibliographical studies of those institutions founded or organized between 1845 and 1865 inclusive.

This is followed by a Bibliography of Books and Miscellaneous Articles on Natural History published separately or in serials of institutions not considered individually in the Bibliography proper. Then follow the Chronological Tables of Publications; the Index of Authors and Naturalists; and the Index of Institutions, which lists many institutions not treated specifically in the body of the work, but whose names appear in connection with the titles enumerated in the section entitled: Bibliography of Books.

The first Appendix contains forty pages of material additional to volume one covering the Annotated Bibliography, the Subject Index, the Geographic Index and the Bibliography of Biographies. These sections should be consulted in conjunction with those in the first volume.

A List of Errata and Addenda for the three volumes is also appended. Through a regrettable oversight the name of Prof. Charles Upham Shepard (1804-1886) has been misspelled Shephard in volumes one and two.

I am deeply indebted to Sabin's classic "Dictionary of Books relating to America," and to the Library of Congress printed cards for much of the bibliographical information to be found in the Bibliography of Books and Articles. To Miss Alice Atwood of the Library of the U. S. Department of Agriculture I am very grateful for her collation of F. A. Michaux's "N. A. Sylva" appearing on pages 379 to 381.

I wish to acknowledge my appreciation of the many courtesies extended and the assistance rendered by Mr. H. B. Weiss of the N. J. State Dept. Agriculture; Dr. L. M. Klauber of the San Diego Society of Natural History; Miss Claribel Barnett and her staff at the Library of the U. S. Dept. Agriculture; Mr. F. E. Brasch, Mr. Dieserud and other members of the staff of the Library of Congress; Miss Mabel Colcord and Mr. Joe S. Wade of the U. S. Bureau of Entomology; to Dr. Charles W. Richmond, curator of Birds, U. S.

National Museum; the Library of the U. S. Geological Survey; Dr. Theodore S. Palmer of the U. S. Biological Survey; Mr. K. K. Mackenzie of Maplewood, N. J.; Mr. Robert Schlachter. My wife, Blanche Gelb Meisel, very kindly verified all the references given in the Index to the Authors and Naturalists.

To the late Mr. A. E. Urban, who supervised the printing of volumes 1 and 2, and to Mr. Jaques Cattell, who supervised the printing of volume 3, and their associates of the Science Press Printing Company I am deeply grateful for their splendid cooperation in seeing through the press a difficult task.

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ARRANGED CHRONOLOGICALLY BY THE RESPECTIVE DATES OF
FORMATION OR ORGANIZATION. (See Table of Contents.)

ABERT'S EXPEDITION ON THE UPPER ARKANSAS (1845)

History

In 1845, Lt. J. W. Abert conducted an expedition for a survey of Purgatory Creek, the waters of the Canadian and False Washita. He was detached from Bent's Fort, and travelled down the Arkansas to the mouth of Purgatory Creek and thence up the stream 15-18 miles.

The journey was begun August 9 and terminated November 12, 1845. Abert's Report was rendered June 12, 1846. It contains many observations on the natural history of the regions explored. For details of the route followed, see WARREN, p. 52. (see Annot. Bibliog. in v. 1.)

Report

1846 ABERT, J[ames] W[illiam]. . . . Report of an expedition on the Upper Arkansas and through the country of the Camanche Indians, in the fall of the year 1845. Wash. 1846. 75 p. 11 pl. sect. map. (In U. S. 29th Cong., 1st sess., Sen. Doc. v. 8, no. 438) Serial no. 477.

Report rev. in Amer. J. Sc. v. 53, (ser. 2, v. 3), p. 301-2. Mar. 1847.

AMERICAN QUARTERLY JOURNAL OF AGRICULTURE & SCIENCE (1845)

History

The first number of the AMERICAN QUARTERLY JOURNAL OF AGRICULTURE & SCIENCE under the editorship of Drs. Ebenezer Emmons and A. J. Prime was issued January 1, 1845. In all, six volumes were issued. With volume 5, the Journal became a monthly. Due chiefly to the connection with the Journal of Emmons, the New York State Geologist, many papers on the natural history subjects were published. Abstracts of the Proceedings of the ASSOCIATION OF AMERICAN GEOLOGISTS & NATURALISTS (1840), q.v., appeared in the Journal.

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1845-47 (THE) AMERICAN QUARTERLY JOURNAL OF AGRICULTURE AND SCIENCE; conducted by Drs E. Emmons, and A. J. Prime. Albany & N. Y., 1845-47. 6v. illus. pl.

v. 3, ed. by Emmons & A. Osborn; v. 4, by Emmons, Osborn and O. C. Gardiner; v. 5, by Emmons and Osborn.

Papers on Natural History

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HUN, Thomas. Food of plants. p. 9-23.

v. 1, no. 2, April.

———. Food of animals. p. 185-204.

EMMONS, Ebenezer. Beds of oyster shells on the Hudson River. p. 215-17.

———. Insects injurious to vegetation, no. 1. p. 250-54.

From Harris's Report on Insects in the Zool. & Bot. Surv. Mass. (1837), q. v.

FITCH, Asa. Insects injurious to vegetation, no. 2: insects of the genus *Cecidomyia*, including the Hessian and wheat fly. p. 255-69, 1 pl. 8 fig.

v. 2, no. 1, July.

EMMONS, Ebenezer. Agricultural geology. p. 1-14.

ANON. Relations of animals and vegetables. p. 15-21.

EMMONS, Ebenezer. On drift and the changes which have been effected in the position of soils, etc. p. 26-33.

Comm. to Assoc. Amer. Geol. & Nat. (1840), in May, 1844.

———. On the supposed *Zeuglodon Cetoides* of Prof. Owen. p. 59-63, 1 pl. (See also p. 366).

v. 2, no. 2, October.

———. On the agricultural adaptations of that portion of the Taconic region, which comprises the counties of Dutchess, Columbia, Rensselaer and Washington in the state of New York, and Berkshire, in the state of Massachusetts. p. 179-98

———. The lost races. p. 199-202.

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BARLOW, Thomas. On the study of entomology. p. 218-20.

BEMENT, C. N. A birdseye view of the vegetable productions, climate, soil and agriculture of the different countries of the American continent. p. 221-26

FITCH, Asa. Insects injurious to vegetation : no. 3 : the wheat-fly. p. 233-64.

Also in N. Y. State Agric. Soc. (1832). Trans. v. 5, p. 255-90, 1 pl. 1845.

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Note by E. EMMONS. Rd. before N. Y. Lyc. Nat. Hist. (1817), in 1845 (Dec.).

BARLOW, Thomas. Entomology : novel productions. p. 45-6.

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EMMONS, Ebenezer. Agricultural geology of Onondaga County. p. 161-93, illus.

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EMMONS, Ebenezer. Description of some of the bones of the Zeuglodon Cetoides of Prof. Owen. p. 223-31.

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v. 4, no. 2, October.

EMMONS, Ebenezer. Mineral and agricultural resources of New York. p. 169-95.

———. The New York system. p. 199-202.

———. Remarks on the Taconic System. p. 202-9.

Com. to Assoc. Amer. Geol. & Nat. (1840), Sept. 1846.

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 CALKINS, Alonzo. Characteristics of animals. p. 238-44.
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 Also in N. Y. State Agric. Soc. (1832). Trans. v. 6, p. 316-73.
 1847.
 Contains a bibliographical sketch. Cont. in next entry.

1847

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———. . . . Hessian fly (cont.). p. 1-27.

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 EIGHTS, James. Notes on natural history. p. 56-7.
 ANON. Specific character. p. 57-9.

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- EMMONS, Ebenezer. The limestones and lime. p. 65-82.
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- EMMONS, Ebenezer. The limestones and lime. p. 113-26.
 See preceding number.

OSBORN, A. Progressive changes of matter. p. 127-36.
 See preceding number.

v. 5, no. 4, April.

- EMMONS, Ebenezer. Distribution of the inorganic matter in vegetables.
 p. 177-206.
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v. 5, no. 5, May.

- BUCKLEY, S. B. On the grasses : no. 2. p. 233-46.
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FITCH, Asa. Winter insects of eastern N. Y. p. 274-84.
 EMMONS, Ebenezer. Remarks on the structure of wood. p. 284-88.

v. 5, no. 6, June.

HOUGH, F. B. Observations on the geology of Lewis County, N. Y. p.
 314-27.

From preceding number, above, q.v.

v. 6, no. 7, July.

WOOLWORTH, Samuel. Description of a tooth of the *Elephas Americanus*. p. 31-7, pl.

v. 6, no. 9, September.

EMMONS, Ebenezer. No coal in the New York rocks, p. 125-29.

FITCH, Asa. List of noxious insects. p. 145-52.

v. 6, no. 10, October.

HALDEMAN, S. S. Description of several new and interesting animals. p. 191-94.

———. Report on the supposed identity of *Atops trilineatus* (Emmons), with *Triarthrus Beckii*. p. 194-95.

Com. to Assoc. Amer. Geol. & Nat. (1840), Sept. 1847. Also in *Amer. J. Sc.* (1818), ser. 2, v. 5, p. 107-8. Jan. 1848. Remarks by Hall, on p. 322-27. May, 1848.

BARLOW, Thomas. *Atropos pulsatorius*. p. 195-96.

BEMENT, C. N. Osier willow—its cultivation. p. 197-98.

v. 6, no. 11, November.

ANON. Mining Report . . . p. 240-46, illus.

Erroneously numbered, p. 192-98.

CLEVELAND ACADEMY OF NATURAL SCIENCE (1845)

History

“Mr. J. D. Whelpley of Cleveland, Ohio, announced the formation of a Society of Natural History at that place, for which he requested donations of minerals.” From *AMERICAN JOURNAL OF SCIENCE*. v. 28, p. 189. April, 1835. This announcement was made at a meeting of the New York Lyceum of Natural History, held on Sept. 22, 1834. The Society seems to have been short-lived. It was, however, the forerunner of the Society organized in 1845 as the CLEVELAND ACADEMY OF NATURAL SCIENCE.

“This Academy was organized Nov. 24, 1845, a public meeting of the citizens of Cleveland having been specifically called for the purpose. At this meeting certain officers were elected, who have, with some exceptions, been continued to the present time.

“The interest manifested by the citizens generally, in the Academy, has been shown, not only by their liberality in contributing the necessary funds for finishing and furnishing the room which contains the museum, but more especially by the general interest manifested in their attendance upon the public meetings of the Academy

. . . The ladies of Cleveland, likewise, generously contributed some four hundred dollars to the Academy . . . Under these favorable auspices, the Academy has commenced and has continued in active operation to the present time. During the winter months, upon each alternate Tuesday, for a number of years, a series of public lectures has been given upon some subject connected with natural science; at the regular meetings between the lectures, written papers on various subjects, having been presented and read and a general discussion held upon any scientific subject which may be offered. It is to the conversational meetings especially, we are to look for valuable contributions in the various branches of natural science, and for the purposes of rendering the labors of the Academy more generally useful, it has been determined to print the record of their transactions in this Journal from time to time.

“The collection of specimens of natural history, particularly in the departments of ornithology and conchology, belonging to the Academy is undoubtedly one of the best in the country. Not only does it contain the fine cabinet of Dr. Kirtland, which has generously been donated by him to the Academy, but also the exceedingly beautiful specimens of the sylvias and water birds of the west, presented by Mr. R. K. Winslow; in addition to these valuable contributions of birds at home, which have from time to time been increased through the kind offices of the gentlemen named and the Hon. Wm. Case, Capt. B. Stannard, and others, large and most valuable donations of foreign birds, chiefly through the assiduous attention of the Hon. Elisha Whittlesey, have been received from time to time. The latest donation of this kind was from Lieut. S. L. Phelps, U. S. N., comprehending complete sets of Chilian birds, in excellent preservation, and to enhance more this contribution, through the courtesy of Prof. S. F. Baird and Mr. J. Cassin, the distinguished ornithologist, they were all named and labelled previous to their reception . . . A fine geological and mineralogical cabinet has also been donated by Prof. St. John & Prof. Cassels, and a complete suite of fossils by Dr. J. S. Newberry; the museum also contains a great variety of fresh water and marine shells . . . so that the collection may be justly ranked as second to but few in the U. S.” From *Annals of Science* (1852), v. 2, p. 1, Jan. 1854.

The officers during the existence of the Academy were: Jared P. Kirtland, president; T. D. Garlick, L. J. Cassels, C. F. Winslow, vice-presidents, 1845–1855; Sherlock J. Andrews, Charles W. Heard,

William D. Beattie, vice-presidents, 1855-1860; J. S. Newberry, recording secretary; Samuel St. John, corresponding secretary. John Kirkpatrick, Thomas Brown and J. H. Klippart, editors of the *Ohio Farmer*, were curators of the Academy.

For the years 1853 and 1854, the *Proceedings of the Society* were published in the *ANNALS OF SCIENCE* (1852), q v. From 1855 to 1860, they were published in the *OHIO FARMER*. In 1874 a volume containing the *Proceedings and Papers of the Academy* were published at Cleveland, which contained reprints of the papers originally published in the periodicals mentioned above. In the *PAPERS ON NATURAL HISTORY* below, "P" indicates the 1874 volume.

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- 1918 CUTLER, H. G. *The Academy of Natural Sciences, and its founders*. Cleveland, 1918. (In *EVERY, E. M. Cleveland and its environs*. v. 1, p. 555-57)

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- 1851 AGASSIZ, Louis. *Letters addressed to J. P. Kirtland, president of the Academy*. P. p. 178-89.

Sent during 1851 and 1852.

KIRTLAND, J. P. *Peculiarities of climate, flora and fauna of the south shore of Lake Erie, in the vicinity of Cleveland, Ohio*. P. p. 165-71. Rd in Dec.

Also in *Amer. J. Sc.* (1818), v. 63 (ser. 2, v. 13), p. 215-19. March, 1852.

- 1852 HARRIS, T. W. *Letters to J. P. Kirtland . . .* P. p. 189-94.

Written July 26, 1852 & Feb. 15, 1853.

BACHMAN, John. *Letter to J. P. Kirtland . . .* P. p. 194-96.

Written March 26, 1852.

KIRTLAND, J. P. *Description of a new species of Libythea and of Macroglossa*. P. p. 171-73.

Also in *Amer. J. Sc.* (1818), v. 63 (ser. 2, v. 13), p. 336-38, illus. May, 1852.

- 1853 NEWBERRY, J. S. *Fossil plants from the Ohio coal basin*. P. p. 26-53, illus. Rd in Jan. et seq.

Also in *Annals Sc.* (1852), v. 1, p. 95-7, 106-8, 152-53, 164-65; & v. 2, p. 2-3, illus. 1853.

KIRTLAND, J. P. *Poecilosoma erythrogastrum*. P. p. 15-6, illus. Rd Nov. 21.

Also in *Annals Sc.* (1852), v. 2, no. 1, p. 4-5, illus. 1854.

———. New locality of *Limnea megasoma* of Say. P. p. 53. Rd Nov. 21.

———. Diurnal Lepidoptera of northern and middle Ohio. P. p. 17-25. Rd Nov. 21, 1853 & Jan. 17, 1854.

Also in *Annals Sc.* (1852), v. 2, p. 45-6, 73-5. 1853.

CASSELS, L. J. Mosses found in the vicinity of Cleveland, Ohio. P. p. 65-74, illus. Rd Nov. 21, 1853 & Jan. 17, 1854.

Also in *Annals Sc.* (1852), v. 2, p. 3-4, 46-7, 102-3, illus. 1854.

1854 GARLICK, Theodatus. On the viviparous or ovoviviparous characters of a species of the Salmonidae. P. p. 64-5. Rd Jan. 17.

Also in *Annals Sc.* (1852), v. 2, p. 44. 1854.

KIRTLAND, J. P. *Alburnus nitidus* (silvery minnow). P. p. 74-5, illus. Rd Jan. 17.

Also in *Annals Sc.* (1852), v. 2, p. 44-5, illus. 1854.

BRAINERD, J[ehu]. The ocean: its origin and phenomena. P. p. 57-64, illus. Rd Jan. 17.

Also in *Annals Sc.* (1852), v. 2. p. 75-6, 101-2, illus. 1854.
Synopsis of a lecture.

NEWBERRY, J. S. Note on the vegetation of the drift. P. p. 76-80. Rd Feb. 7.

Also in *Annals Sc.* (1852), v. 2, p. 76-7. 1854.

KIRTLAND, J. P. Revision of the species belonging to the genus *Esox*, inhabiting Lake Erie and the River Ohio. P. p. 83-5, illus. Rd Feb. 7.

Also in *Annals Sc.* (1852), v. 2, p. 78-9, illus. 1854.

GARLICK, Theodatus. On the artificial reproduction of fishes. P. p. 86-91. Rd Feb. 7.

Also in *Annals Sc.* (1852), v. 2, p. 71-3. 1854.

HARRIS, T. W. On the larva of *Vanessa acutus* (sharp-tailed minnow). P. p. 96, illus. Rd Mar. 21.

Also in *Annals Sc.* (1852), v. 2, p. 101, illus. 1854.

WHITTLESEY, Charles. The Alleghany coal-field. P. p. 99-113. Rd April 17.

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1856 KIRTLAND, J. P. The *Guava-Psidium cattlyanum*. P. p. 117-18. Rd Nov. 14.

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1858 BRAINERD, J[ehu]. Analysis of Berea sandstones. P. p. 144-46. Rd Jan. 8.

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WHITTLESEY, Charles. Chronology of trees—comparison of layers of growth. P. p. 147-51. Rd Jan. 22.

Also in Ohio Farmer.

KIRTLAND, J. P. Mounted birds from northern Ohio in the Academy's Museum. P. p. 201-87.

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FREMONT'S EXPLORATIONS IN UPPER CALIFORNIA (1845)

History

During 1845, 1846 and 1847, J. C. Fremont continued his explorations begun in FREMONT'S EXPED. TO OREGON & CALIFORNIA (1843), q.v. Explorations were begun Aug. 1845, and Fremont was assisted by E. M. Kern, W. G. Peck, Jr., and J. W. Abert. He made a Report in June, 1848, which was published the same year. For routes followed, see WARREN, p. 49-51. (see Annot. Bibliog. in v. 1.)

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See also FREMONT'S EXPED. BETWEEN MISSOURI RIVER & ROCKY MTS. (1842) : Bibliography.

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1876 KERN, E. . . M. . . . Journal of an exploration of Mary's or Humboldt River, Carson Lake, in 1845, under Fremont. Washington, 1876. (In SIMPSON, J. H. Rept. Explor. across Great Basin of Utah. p. 475-86).

1928 NEVINS, Allan. Fremont the West's greatest adventurer. . . . N. Y. Harper, 1928. 2 v. illus. pl. port.

Report

(1) Senate ed. Serial no. 511.

1848 FREMONT, John Charles. . . . Geographical memoir upon Upper California in illustration of his map of Oregon and California. . . .

Washington, Wendell & Van Benthuysen, 1848. 65 p. map. (In U. S. 30th Cong., 1st. sess., Sen. Misc. Doc. no. 148) Serial no. 511.

(2) House ed. Serial no. 544.

- 1849 ————. Same . . . Wash. 1849. 40 p. map. (In U. S. 30th Cong., 2d sess., H. Misc. Doc. no. 5) Serial no. 544.

Papers in Society Transactions

See FREMONT'S EXPED. TO OREGON & CALIFORNIA (1843): Papers in Society Transactions.

ABERT'S EXAMINATION OF NEW MEXICO (1846)

History

In 1846 Lt. J. W. Abert was instructed by the War Department to make an examination of New Mexico, while attached to the force under Gen. Kearny. Lt. Abert was assisted by Lt. Peck.

The expedition left Fort Leavenworth, June 27, 1846, and returned there in March, 1847, after completing the examination. His Report was published in 1848. Some natural history observations of the country traversed were made. For details of route followed, see WARREN, p. 53-4. (see Annot. Bibliog. in v. 1.)

Augustus Fendler working under instructions from the Smithsonian Institution for the collection of botanical specimens in New Mexico, set out with Abert's party. See PAPERS below for descriptions of his collections.

Bibliography

- 1882 ABERT, J[ames] W[illiam]. Memoranda in regard to the various kinds of birds, which I took note of in a march across the prairies from Fort Leavenworth, Mo., to Santa Fe, New Mexico, and again via the Santa Fe trail, in the years 1845 and 1847. (In Cincinnati Soc. Nat. Hist. Jour. v. 5, p. 57-9. 1882.)

Report

(1) Senate ed., Serial no. 506.

- 1848 ABERT, J[ames] W[illiam]. Report and map of the examination of New Mexico in the years 1846-47, while attached to the command of General Kearny. Washington, 1848. 132 p. 24 pl. map. (In U. S. 30th Cong., 1st sess., Sen. Ex. Doc. v. 4, no. 23). Serial no. 506.

(2) House ed., Serial no. 517.

———. Same. Wash. 1848. (In U. S. 30th Cong., 1st sess., H. Ex. Doc. v. 4, no. 41, p. 417-548, 24 pl. map). Serial no. 517. It is included here in a Report of EMORY'S RECONN. FORT LEAVENWORTH TO SAN DIEGO (1846), q. v., as an appendix.

CONTENTS:

- p. 1-130 ABERT, J. W. Report.
Repr. in Serial 517, p. 417-546.
- p. 131- 32 BAILEY, J. W. Notes concerning the minerals and fossils collected by Lt. J. W. Abert, while engaged in the geographical examination of New Mexico. 3 pl.
In Serial 517, p. 547-48, 3 pl.

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- 1847 ABERT, J. W. A supposed new species of quail inhabiting New Mexico. Rd before Phila. Acad. Nat. Sc. (1812), June 29, 1847.
In its Proc. v. 3, p. 221-22.
- 1848 GRAY, Asa. *Plantae Fendlerianae Novi-Mexicanae*: an account of a collection of plants made chiefly in the vicinity of Santa Fe, New Mexico, by Augustus Fendler; with descriptions of the new species; critical remarks, and characters of other undescribed or little known plants from surrounding regions.
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- SULLIVANT, W. S. Contributions to the Bryology and Hepaticology of North America; pt. 2.
Rd before Amer. Acad. A. & Sc. (1780), Nov. 8, 1848. In its Mem. n. s. v. 4, pt. 1, p. 169-76, 5 pl. [58 fig.]

CHARLESTON MEDICAL JOURNAL (1846)

History

In 1846, the CHARLESTON MEDICAL JOURNAL & REVIEW, made its first appearance at Charleston, S. C., under the name of the SOUTHERN JOURNAL OF MEDICINE & PHARMACY, edited by Messrs. J. Lawrence Smith, the mineralogist, and Dr. S. D. Sinkler. With the third volume, the name was changed to that noted in the title.

It was published bi-monthly, beginning with January, 1847, number.

The natural history material published in the Journal was due to a group of southern naturalists, consisting of Dr. John Bachman

H. W. Ravenel, Myddelton Michel, F. P. Porcher, F. S. Holmes. Below under PAPERS ON NATURAL HISTORY, will be found the articles on natural history published in volumes one to ten.

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v. 2, ed., by P. C. Gaillard & H. W. De Saussure.

Continued as (2), v. 3-15

- 1848 CHARLESTON MEDICAL JOURNAL AND REVIEW; ed. by J. D. Cain and F. P. Porcher. Charleston, S. C., Jan. 1848-1860. 13 v.

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- 1846 v. 1, no. 3, May

MICHEL, Myddelton. Organogeny, or the science of organization. p. 241-59.

- 1847 v. 2, no. 3, May

PORCHER, F. P. A medico-botanical catalogue of the plants and ferns of St. John's, Berkeley, S. C. p. 255-86.

Cont. in next number (q.v.).

v. 2, no. 4, July

———. A catalogue of phaenogamous plants and ferns, native, naturalized and exotic, collected in the parish of St. John's, Berkeley, S. C. lat. 31° 10' long. 33° 15' lands lying between the waters of Cooper and Santee Rivers, forty miles from the ocean; twenty feet above tide level, embracing a growth of oak, hickory, swamp and river trees. p. 397-417.

Cont. from preceding no. (q.v. above).

v. 2, no. 5, September

HOLMES, F. S. Description of a Bezoar stone found in the stomach of a buck (*Cervus virginianus*, GM.). p. 527-30.

- 1848 v. 3, no. 6, November

———. Notes on the geology of Charleston. p. 655-71.

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1849

v. 4, no. 1, January

RAVENEL, H. W. An enumeration of some new phaenogamous plants, not heretofore published as inhabiting South Carolina found in the vicinity of the Santee Canal. p. 32-8.

v. 4, no. 4, July

———. Contributions to the cryptogamic botany of South Carolina. p. 428-33.

Cont. below in v. 5, no. 3 (q.v.).

v. 4, no. 6, November

RAVENEL, Edmund. On the medical topography of St. John's, Berkeley, S. C., and its relations to geology. p. 697-704.

1850

v. 5, no. 2, March

BACHMAN, John. An investigation of the cases of hybridity in animals on record, considered in reference to the unity of the human species. p. 168-97.

v. 5, no. 3, May

RAVENEL, H. W. Contributions to the cryptogamic botany of South Carolina. p. 324-27.

Cont. from v. 4, no. 4, (above, q.v.) & cont. below in v. 6, no. 2 (q.v.)

MORTON, S. G. Letter to the Rev. John Bachman on the question of hybridity in animals considered in reference to the unity of human species. p. 328-44.

v. 5, no. 4, July

BACHMAN, John. A reply to the letter of Samuel George Morton, M.D., on the question of hybridity in animals considered in reference to the unity of human species. p. 466-508.

v. 5, no. 5, September

———. Second letter to Samuel G. Morton on the question of hybridity in animals, considered in reference to the unity of human species. p. 621-60.

v. 5, no. 6, November

BRAUCH, J. Contributions to the indigenous materia medica of S. C. p. 742-44.

MORTON, S. G. Additional observations on hybridity in animals and on some collateral subjects, being a reply to the objections of the Rev. John Bachman. p. 755-805.

1851

v. 6, no. 1, January

MICHEL, Myddelton. Researches on the generation and development of the Opossum (*Didelphis Virginiana*). p. 111-15.

Also read before Amer. Assoc. Adv. Sc. (1848), Mar. 13, 1850. In its Proc. v. 3, p. 60-4. 1850.

MORTON, S. G. Notes on hybridity, designed as a supplement to the memoir on that subject in the last number of this Journal. p. 145-52.

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Previous pt. pub. in v. 5, no. 3, (above, q v.).

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———. Notes on hybridity in animals, and on some collateral subjects . . . being a third letter . . . p. 373-83.

BACHMAN, John. Additional observations on hybridity in animals, and on some collateral subjects . . . p. 383-96, 598.

1854

v. 9, no. 5, September

———. Types of mankind: an examination of a few statements of Prof. Agassiz, in his "Sketch of the natural provinces of the animal-world, and their relation to the different types of men." p. 627-59, 790-806.

1855

v. 10, no. 2, March

———. An examination of the characteristics of genera and species as applicable to the doctrine of the unity of the human race. p. 201-22.

v. 10, no. 4, July

———. An examination of Prof. Agassiz's "Sketch of the natural provinces of the animal world, and their relation to the different types of man . . . p. 482-534.

Also pub. as a separate. Charleston, 1855. 54 pp. Agassiz's paper in *New Phil. Jour. Edinb.* v. 57, p. 347-63. 1854.

CONCORD NATURAL HISTORY SOCIETY,
CONCORD, N. H. (1846)

History

The Concord, N. H., Natural History Society had its origin in a meeting held in the office of Gen. Charles H. Peaslee on Feb. 14, 1846. On the 28th of the same month, the following officers were elected: William Prescott, president; N. G. Upham and Paul Wentworth, vice-presidents; William Kent, recording secretary; Asa Fowler, corresponding secretary; William C. Prescott, curator and librarian. Official announcement of the organization of the Society to the scientific world was made through the *American Journal of Science*, v. 52 (n. s. v. 2), p. 144. Nov. 1846.

“ . . . The Natural History Society has enrolled more than 200 members (resident) and about 120 corresponding members . . . It has a hall fifty by thirty feet and a spacious room adjoining, in Ayer's Block on Main Street, at the southeast corner of the State House yard. In these are contained five or six hundred specimens in geology and mineralogy; one or two hundred in conchology; a variety of insects; interesting artificial curiosities and the nucleus of a library. Meetings are held Saturday afternoons with a view to mutual self-improvement.”

“The interest in the Society, thus early manifested, continued for some time; its cabinet was enriched; addresses were delivered and papers read at its meetings. It became also the depository of numerous specimens of the New Hampshire Geological Survey (1839), q.v., collected by Dr. C. T. Jackson in his scientific survey of the state. But at last, after eighteen years of more or less active existence, it lost, in a fire, which, on the 22d of the April, 1864, destroyed the two upper stories of Ayer's Block, its hall with the valuable contents thereof, and never afterward renewed its praiseworthy efforts.”

“Dr. William Prescott, a diligent scientist, and the Society's first president, had also his private cabinet of geology, mineralogy, conchology, ornithology, etc., laboriously collected and scientifically arranged in a hall connected with his residence.” LYFORD, J. O. 1903. v. 1, p. 388-90. (See Bibliography below).

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EMORY'S RECONNAISSANCE FROM FORT LEAVENWORTH TO SAN DIEGO (1846)

History

Between June 27, 1846 and January 1847, Lieut. W. H. Emory conducted a military reconnaissance between Fort Leavenworth and

San Diego, Cal., by way of part of the Arkansas, Del Norte and Gila Rivers. He was accompanied by Lieut. J. W. Abert, W. G. Peck, S. P. Cooke and J. M. Stanley. Norman Bestor and Lt. A. R. Johnston were also members of the expedition.

Emory's Report was published in 1848. John Torrey described the plants collected and George Engelmann, the Cactaceae. J. W. Abert described the other natural history collections.

For details of the routes followed see Warren, p. 52-3. (see Annot. Bibliog. in v. 1.) The House edition of the Report also contained ABERT'S EXAMINATION OF NEW MEXICO (1846), q.v.

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American ed., N. Y. Appleton, 1849. 29 + 83 p.

- 1855 EMORY, William H[elmsley]. . . . Extract from a Report of a Military Reconnaissance, made in 1846 and 1847. Washington, 1855. 22 p. (In Pacific Railroad Surveys. Final Reports. v. 2, pt. 6).

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- 1848 EMORY, William H[elmsley]. . . . Notes of a military reconnaissance from Fort Leavenworth, in Missouri, to San Diego, in California, including part of the Arkansas, Del Norte, and Gila Rivers . . . made in 1846-47, with the advance guard of the "Army of the West" . . . Washington, 1848. 416 p. illus. 39 pl. (In U. S. 30th Cong., 1st sess., Sen. Ex. Doc. v. 3, no. 7). Serial no. 505.

(2) House edition, Serial no. 517.

———. Same . . . Washington, 1848. 614 p. illus. pl. map. (In U. S. 30th Cong., 1st sess., H. Ex. Doc. v. 4, no. 41). Serial no. 517.

Rev. in Amer. J. Sc. v. 56 (ser. 2, v. 6), p. 386-92. Nov. 1848.

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- p. 1-134 EMORY, W. H. Report.
 p. 135-154 TORREY, John. Description of the plants collected. . . .
 12 pl. Written Feb. 10, 1848.
 p. 155-158 ENGELMANN, George. Descriptions of the collection of
 Cactaceae . . . Written Feb. 13, 1848.
 p. 160-385 EMORY, W. H. Meteorological, astronomical and geo-
 graphical observations . . .
 p. 386-414 ABERT, J. W. On the natural history of the reconnais-
 sance . . . Written Oct. 8, 1847.

In Serial no. 517, only.

- p. 415- 16 COOKE, S. P. Report.
 p. 417-548 ABERT, J. W. Report . . .
 See ABERT'S EXAM. NEW MEXICO (1846).
 p. 549- 63 COOKE, S. P. Report of march from Santa Fe, New
 Mexico to San Diego . . .
 p. 565-614 JOHNSTON, A. R. Journal . . .

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- 1856 ENGELMANN, George. Synopsis of the Cactaceae of the territory of the
 United States and the adjacent regions . . . and corrections and addi-
 tions . . .
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OHIO AGRICULTURAL REPORTS (1846)

History

The Annual Reports of the State Board of Agriculture of Ohio, first begun in 1846, contain a number of papers and articles on natural history matters. W. W. Mather, state geologist of Ohio (1837), q.v., was secretary of the Board for two years, 1851 and 1852. For a complete bibliography of the Reports as they appear in the Ohio State Documents, see HASSE, A. R. Index to the State Documents of Ohio. Wash. 1912. v. 1, p. 134. (Carnegie Inst. Wash. Pub., no. 85).

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1857

v. 12

———. On insects beneficial to the agriculturist. p. 513-25.

ANON. Natural history of Ohio: geology and meteorology. p. 526-32.

WHITTLESEY, Charles. Outline sketch of the geology of Ohio. p. 533-47.

Condensed notice, repr. from Howe's "Historical Coll."

HIGGINS, Frank. A catalogue of the shell-bearing species of Mollusca inhabiting the vicinity of Columbus, Ohio, with some remarks thereon. p. 548-55.

KLIPPART, J. H. An essay on the origin, growth, diseases, varieties, etc., of the wheat plant. p. 562-81.

1858

v. 13

KIRKPATRICK, John. Bots and bot-flies. p. 330-37, illus.

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ANON. Effect of the various degrees of temperature upon the germination of plants. p. 286-300.

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ANON. Principles of breeding. p. 279-316.

KIRKPATRICK, John. The army-worm. p. 350-58.

———. Description of two probably new Diptera, belonging to the Tachinidae, parasitic on the caterpillars of the army-worm moth (*Leucania extranea*—*exorista leucaniae* Ex. Osten-Sackenii). p. 358.

WHEATON, J. M. Catalogue of the birds of Ohio. p. 359-81, 480.

COLLINS, W. O. Report of the Senate Select Committee upon Senate Bill, no. 12, "For the protection of birds and game." p. 381-90.

1861

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ANON. Fungi. p. 404-20, illus.

KIRKPATRICK, John. The grain aphid. p. 429-33, illus.

1862

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WARDER, J. A. Lecture on plant life. p. 297-312.

*ST.-HILAIRE, Geoffrey, and KLIPPART, J. H. Zoological and geographical origin of domestic animals; transl. from the French of G. St. Hilaire, by J. H. Klippart. p. 319-39.

1863

v. 18

SALISBURY, J. H., and SALISBURY, C. B. Microscopic researches, resulting in the discovery of what appears to be the cause of the so-called blight in apple, pear and quince trees, and the decay in their fruit. p. 450-60.

———. Researches resulting in the discovery of the cause of the so-called "Blister and curl" in the leaves of the peach trees and the decay in the peach fruit; with observations on the development of the peach fungus (*Sphaerotheca persicae*, Salisb.). p. 460-79, illus.

1865

v. 20

ANDREWS, E. B. Geological report of Ohio. p. 249-64, illus.

SMITHSONIAN INSTITUTION, WASHINGTON, D. C. (1846)

History

"James Smithson, Esq., of England, left his property in trust to the United States of America to found at Washington an Institution which should bear his name and have for its objects the 'Increase and diffusion of knowledge among men.' This trust was accepted by the government of the United States, and an Act of Congress was passed August 10th, 1846, constituting the President and other principal executive officers of the general government, the Chief Justice of the Supreme Court, the Mayor of Washington, and such other persons as they might elect honorary members, an establishment under the name of the SMITHSONIAN INSTITUTION FOR THE INCREASE AND DIFFUSION OF KNOWLEDGE AMONG MEN." The members and honorary members of this establishment are to hold stated and special meetings for the supervision of the affairs of the Institution, and for the advice and instruction of a Board of Regents, to whom the financial and other affairs are entrusted." (Advertisement to the volumes of the Smithsonian Contributions to Knowledge.)

In 1835 the United States received the first intimation of the bequest of James Smithson (1765-1829), an English chemist, who

left the sum of \$508,318.46 for the founding of an institution to be known as the Smithsonian Institution.

The exact use to which the money should be put and the manner and character of its employment were the subject of heated discussions and wranglings amongst the men of the day, laymen and scientists. The Institution was created by Congress under the act signed by President J. K. Polk on August 10, 1846, and was to comprise a national museum, a scientific library with copyright privileges, a national art gallery, etc., with especial emphasis on the publication of scientific results. The executive and administrative work was put under the general supervision of a Secretary, and the finances and trusteeship in the hands of a Board of Regents.

Joseph Henry, physicist, then of Princeton University (College of New Jersey), was selected to plan the organization and erect the superstructure. His all-embracing Programme of Organization appeared December 8, 1847, and laid the foundations for the Institution as it is to-day.

The corner-stone of the building to house the Institution was laid May 1, 1847, and the building was completed under the supervision of James Renwick, the architect, in 1855 at a cost of \$315,000.

Henry was assisted by Charles C. Jewett as assistant secretary in charge of the Library, and shortly after by Spencer Fullerton Baird, naturalist, in charge of the collections, subsequently known as the National Museum, which since 1858 has received the support of the U. S. Congress.

In 1847, Henry issued his first annual report as the Secretary of the Institution, the first of a series, combining in general an administrative report with popular papers either descriptive of the collections or on scientific matters of importance. In 1848 was issued the first volume of the Smithsonian Contributions to Knowledge, which were to comprehend only original contributions to knowledge, the publication of which was subject to the recommendation of a Committee of Publication. In 1852 appeared the first paper belonging to the series known as the Miscellaneous Collections. (See below for dates of publication and bibliographical data respecting the various volumes published prior to 1866.)

In 1851, the Institution began the International Exchange System, by which it became the center for the exchange of foreign publications for those of the institutions of the United States. From

the beginning it aimed and succeeded in building up a great reference library of scientific transactions and proceedings, which was subsequently deposited in the Library of Congress as the Smithsonian deposit.

The Museum profited enormously from the collections brought together by the various exploring expeditions sent out by the federal government during the forties and fifties, notably the Pacific Railroad Surveys (1853), the U. S. & Mexican Boundary Survey (1848), the Rodgers & Ringgold North Pacific Exploring Expedition (1853), the Wilkes U. S. Exploring Expedition (1838), the collections of which were originally under the supervision of the National Institution for the Promotion of Science (1840), q. v., and Perry's U. S. Japan Expedition (1852), etc.

In addition the Institution received large numbers of specimens from various private collectors among the military, etc., and from agents of its own whom it sent out to make collections.

The scientific results of the Pacific Railroad Surveys (1853), q. v., were described by members of the staff of the Institution under the general supervision of the Assistant Secretary, Spencer F. Baird.

Only the salient facts in the history of the Institution have been outlined above as the various papers noted below in the BIBLIOGRAPHY cover every phase of the activities of the Institution and are readily accessible. Especial reference should be made to the volume edited by Dr. G. B. Goode, issued in 1897 (see below BIBLIOGRAPHY: 1897: Goode), celebrating the semi-centennial of the Institution, which comprehends excellent essays on every phase of the work of the Institution since its foundation, by members of its staff, and others.

Below will be found a chronological list of the PAPERS ON NATURAL HISTORY to be found in the publications of the Smithsonian prior to 1866, with the necessary bibliographical details and cross-references.

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- 1844 BRENT, John Carroll. Letters on the National Institute, the Smithsonian legacy . . . and other matters connected with the interests of the District of Columbia. Wash, J. & G. S. Gideon, 1844. 90 p.
- 1847 SMITHSONIAN INSTITUTION. Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures and condition of the . . . for 1846-date. Wash. Smith. Inst., 1847-date.
- Includes the Reports of the Secretary, Assistant Secretaries, Curators of Departments, and papers on natural history and on the physical sciences, of a popular character.
For dates of publication of the volumes 1-20, 1846-65, see below ANNUAL REPORT. For the natural history contents of these volumes see below PAPERS ON NATURAL HISTORY.
- 1848 ———. Smithsonian Contributions to Knowledge . . . Wash., Pub. by the Smithsonian Institution, 1848-date. v. 1-date, illus. pl. plans, tab. maps. 4°.
- The dates of publication of these quarto volumes, and their contents will be found below under SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE: Dates of Publication.
- 1849 HENRY, Joseph. Organization of the Smithsonian Institution. Phila., 1849. (In Amer. Assoc. Adv. Sc. Proc. for 1848. v. 1, p. 82-90)
- Rd before the Association, Sept. 23, 1848, at its first meeting.
- 1852 SMITHSONIAN INSTITUTION. Smithsonian Miscellaneous Collections . . . Wash., Pub. by the Smithsonian Institution, [1852]-date. v. 1-date.
- The title-page of v. 1, is 1862, but the volume is a combination of several papers all of which were issued as separates before 1862, the first bearing the date, 1852. For the dates of the publication of the volumes pub. to 1866 see below SMITHSONIAN MISCELLANEOUS COLLECTIONS.
- 1855 [SILLIMAN, Benjamin]. The Smithsonian Institution. (In Amer. J. Sc. ser. 2, v. 20, p. 1-21. July, 1855)
- A review of various public documents relative to the then mooted question as to the best manner in which to employ Smithson's bequest through the agency of the Institution.
- 1857 RHEES, William J[ones]. An account of the Smithsonian Institution, its founder, building, operations, etc., prepared from the Reports of Prof. Henry to the Regents, and other authentic sources. Washington, Thomas McGill, 1857. 54 p.

- 1859 SMITHSONIAN INSTITUTION. Catalogue of publications of Societies, and other periodical works in the library, of . . . July 1, 1858: Foreign works. Wash. 1859. 259 p. (In its Misc. Coll. v. 3, art. 4)
- 1862 ————. Smithsonian Miscellaneous Collections . . . Wash. 1862—date. v. 1—date.
See 1852 above.
[BAIRD, Spencer Fullerton]. . . List of foreign correspondents of the . . . January 1862. Wash., May, 1862. 3+52 p. (In its Misc. Coll. v. 5, art. 3). Pub. no. 154.
———. Catalogue of publications of the Smithsonian Institution, corrected to June, 1862. Wash., June, 1862. 7+44 p. (In its Misc. Coll. v. 5, art. 2).
- 1863 ANON. Recent exploration encouraged by the Smithsonian Institution. (In Amer. J. Sc. ser. 2, v. 35, p. 236—39. March, 1863).
Abstracted from the Annual Report of the Institution for 1862.
- 1866 RHEES, William J[ones]. . . Catalogue of publications of societies and of periodical works belonging to the Smithsonian Institution, Jan. 1866, deposited in the Library of Congress. Wash. 1866. 591 p. (In its Misc. Coll. v. 9).
———. List of works published Jan., 1866. Wash 1866. 11 p. (In its Misc. Coll. v. 7, art. 12). Pub. no. 203.
- 1879 ————. . . . The Smithsonian Institution: Documents relative to its origin and history; edited by William J. Rhees. Wash., Smithsonian Institution, 1879. 14+1013 p. (In Smith. Inst. Misc. Coll. v. 17, art. 1). Pub. no. 328.
———. . . . The Smithsonian Institution: Journals of the Board of Regents, Reports of Committees, Statistics, etc., edited by William J. Rhees. Wash., Smithsonian Institution, 1879. 7+844 p. (In Smith. Inst. Misc. Coll. v. 18, art. 1). Pub. no. 329.
- 1880 ————. James Smithson and his bequest. Wash., Smithsonian Institution, 1880 [8]+68 p. pl. port. (In Smith. Inst. Misc. Coll. v. 21, art. 1). Pub. no. 330.
See also "Scientific character and scientific writings of J. S." (In Smith. Inst. Misc. Coll. v. 21, art. 2. 159 p.). Pub. no. 327.
- 1881 SMITHSONIAN INSTITUTION. Memorial of Joseph Henry. Wash., Smithsonian Institution, 1881. 4+528 p. port. (In Smith. Inst. Misc. Coll. v. 21, art. 3). Pub. no. 356.

- 1882 BOEHMER, George H. History of the Smithsonian exchanges . . . Wash., Smithsonian Institution, 1882. 7+162 p.
From Smith. Inst. Ann. Rept. for 1881. p. 703-811.
- 1882 RHEES, William J[ones]. . . Catalogue of publications of the Smithsonian Institution, (1846-1882), with an alphabetical index of articles in the Smithsonian Contributions to Knowledge, Miscellaneous Collections, Annual Reports, Bulletins and Proceedings of the United States National Museum, and Report of the Bureau of Ethnology. Wash., Smith. Inst., 1882. 14+342 p. (In Smith. Inst. Misc. Coll. v. 27, art. 4). Pub. no. 478.
- 1889 ———. Catalogue of the publications of the Smithsonian Institution. Wash., Smith. Inst., 1889. (In Smith. Inst. Ann. Rept. for 1886. pt. 1, p. 485-878).
- 1895 GOODE, George Brown. An account of the Smithsonian Institution: its origin, history, objects and achievements. Washington. For distribution at the Atlanta Exposition, 1895. 38 p. pl. port.
See also *The Chautauquan*. v. 5 p. 275-79.
- 1896 BOLTON, Henry Carrington. The Smithsonian Institution: its origin, growth and activities. (In *Popular Sc. Monthly*. v. 48, p. 289-303, 449-64. 1896).
- 1897 GOODE, George Brown, ed. The Smithsonian Institution: the history of its first half-century; edited by George Brown Goode. City of Washington, 1897. [11]+856 p. pl. port. plan. 4°. (Pub. no. 1086).

A collection of essays on the various phases and aspects of the Institution's work from its foundation in 1846 to the close of 1896.

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- ch. 1 James Smithson, by Samuel Pierpont Langley. p. 1-24.
- 2 The founding of the Institution, 1835-1846, by George Brown Goode. p. 25-58.
- 3 The Establishment and the Board of Regents, by G. B. Goode. p. 59-114.
- 4 The three Secretaries, by G. B. Goode. p. 115-234.
- 5 The benefactors, by S. P. Langley. p. 235-46.
- 6 The Smithsonian Building and grounds, by G. B. Goode. p. 247-64.
- 7 The Smithsonian Library, by Cyrus Adler. p. 265-302.
- 8 The United States National Museum, by Frederick William True. p. 303-66.
- 9 Bureau of American Ethnology, by W. J. McGee. p. 367-96.
- 10 The International Exchange system, by William Crawford Winlock. p. 397-418.

- 11 The Astrophysical Laboratory, by S. P. Langley. p. 419-42.
- 12 National Zoological Park, by Frank BAKER. p. 443-58.
- 13 Exploration work of the Smithsonian Institution, by F. W. TRUE. p. 459-80.
- 14 Smithsonian Publications, by Cyrus ADLER. p. 481-500.
- 15 Biographical sketch of George Brown Goode, by D. S. JORDAN. p. 501-15.

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1. Physics, by T. C. MENDENHALL. p. 519-60.
 2. Mathematics, by R. S. WOODWARD. p. 561-70.
 3. Astronomy, by E. S. HOLDEN. p. 571-610.
 4. Chemistry, by Marcus BENJAMIN. p. 611-30.
 5. Geology and mineralogy, by W. N. RICE. p. 631-46.
 6. Meteorology, by Marcus BENJAMIN. p. 647-78.
 7. Palaeontology, by E. D. COPE. p. 679-96.
 8. Botany, by W. G. FARLOW. p. 697-710.
 9. Zoology, by T. N. GILL. p. 711-44.
 10. Anthropology, by J. W. FEWKES. p. 745-72.
 11. Geography, by G. G. HUBBARD. p. 773-84.
 12. Bibliography, by H. C. BOLTON. p. 785-804.
 13. The cooperation of the Smithsonian Institution and other institutions of learning, by D. C. GILMAN. p. 805-14.
 14. The influence of the Smithsonian Institution upon the development of libraries, the organization and work of societies, and the publication of scientific literature in the United States, by J. S. BILLINGS. p. 815-22.
 15. Relation between the Smithsonian Institution and the Library of Congress, by A. R. SPOFFORD. p. 823-30.
 16. Principal events in the history of the Institution, by W. J. RHEES. p. 833-41.
- Index. p. 843-56.

- 1901 RHEES, William Jones. The Smithsonian Institution: documents relative to its origin and history, 1835-1899. Washington, The Smithsonian Institution, 1901. 2 v. (In its Misc. Coll. v. 42 & v. 43).

v. 1, 1835-1887, 53 + p. 1-1044.
v. 2, 1887-1899, 16 + p. 1045-1983.

- 1902 GEARE, Randolph I[ltyd]. A list of the publications of the United States National Museum (1875-1900), including the Annual Reports, Proceedings, Bulletins, Special Bulletins and Circulars, with index to titles. Wash., Gov't print. office, 1902. 7 + 168 p. (In U. S. Nat. Mus. Bull. no. 51).

List of publications, p. 1-130. Index, p. 131-68.
Supplement no. 1. Wash. 1906. 40 p.
Supplement no. 2, 1906-12. Wash. 1914. 41 + 7 p.

- 1903 RHEES, William Jones. List of the publications of the Smithsonian Institution: 1846-1903. Wash. 1903. 99 p. (In Smith. Inst. Misc. Coll. v. 44).

Pt. 1, Complete list; Pt. 2, Available for distribution.

See Rhees' "Catalogue . . ." above under 1882.

- 1905 RATHBUN, Richard. The United States National Museum: an account of the buildings occupied by the national collections. Wash. 1905. (In U. S. Nat. Mus. Ann. Rept. for 1903. p. 177-309, 29 pl.).

- 1915 DALL, William Healey. Spencer Fullerton Baird: a biography, including selections from his correspondence with Audubon, Agassiz, Dana, and others. Phila. & Lond., Lippincott, 1915. 16 + 462 p. illus. pl. port.

The greater portion of the book deals with Baird's work with the Smithsonian first as assistant secretary and subsequently as secretary.

- 1917 BENJAMIN, Marcus. Memories of the Smithsonian. (In Scientific Monthly. v. 4, no. 5, p. 461-72, port. May, 1917).

CLARK, A[lonzo] Howard. Administration and activities of the Smithsonian Institution. Wash. 1917. (In Smith. Inst. Ann. Rept. for 1916. p. 137-55, 22 pl. port.).

- 1926 CLARK, Austin H[obart]. The Smithsonian Institution, its function and its future. (In Science n. s. v. 63, p. 147-57. Feb. 5, 1926).

Delivered before Amer. Assoc. Adv. Sc. Jan. 1, 1926.

SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE (S. C.)

Dates of Publication

The articles are separately indexed and paged, with separate publication dates, which will be found under the respective entries in the "PAPERS ON NATURAL HISTORY." Below are given the dates of the title-pages of the completed volumes.

v. 1, 1848, art. 1, 39 + 306 p. 207 illus. 48 pl.

v. 2, 1851, art. 1-9, appx. (1-4), 15 + 60 + [33] + 15 + 64 + 13 + 28 + 19 + 48 + 188 + 32 + 10 + 9 + 26 p. 24 pl. (560 p.)

v. 3, 1852, art. 1-7, appx. (1-2), 15 + 29 + [60] + 80 + 152 + 146 + 14 + 20 + 9 + 34 p. 35 pl. (559 p.)

v. 4, 1852, art. 1, [20] + 338 p.

v. 5, 1853, art. 1-6, 14 + 68 + 20 + [52] + 258 + 119 p. 45 pl. (531 p.)

v. 6, 1854, art. 1-7, appx., 14 + 24 + [8 + 8 + 67 + 198] + 126 + 35 p. 53 nl. (480 n.)

- v. 7, 1855, art. 1-5, appx., 14 + [12 + 16] + 95 + 68 + 35 p. 73 pl. map. (240 p.)
- v. 8, 1856, art. 1-5, appx. (1-2), 14 + 168 + 52 + 16 + [138 + 122] + 34 p. 9 pl. 27 illus. (444 p.)
- v. 9, 1857, art. 1-5, appx. (1-2), 14 + 58 + [8] + 155 + 33 + [68 + 64] + 71 p. 22 pl. (471 p.)
- v. 10, 1858, art. 1-4, [13] + 142 + [72 + 23 + 71 + 136 p.] 15 pl. map. (457 p.)
- v. 11, 1859, art. 1-8, 14 + 8 + 132 + [22 + 22 + 120 + 64 + 28] + 92 p. 23 pl. (502 p.)
- v. 12, 1860, art. 1-6, [13 + 56 + 27 + 186 + 94 + 154 p.] 3 pl. 12 illus. (530 p.)
- v. 13, 1863, art. 1-9, 14 + [90 + 162] + 32 + [28 + 16 + 78 + 88] + 50 p. 4 pl. 3 maps. (558 p.)
- v. 14, 1865, art. 1-6, 14 + [72 + 43 + 58 + 155 + 138 p.] 25 pl. (480 p.)
- v. 15, 1867, art. 1-5, 14 + [117] + 32 + [168 + 284 p.] 17 pl. 43 illus. (615 p.)

SMITHSONIAN MISCELLANEOUS COLLECTIONS (M. C.)

Dates of Publication

The various articles in these volumes were published separately, and combined to form the M. C., with the title-page dates as noted below. The exact dates of publication for the separate articles are given with the individual entries under "PAPERS ON NATURAL HISTORY."

- v. 1, 1862, art. 1- 3, (1860, 1856, 1859), [7] + 20 + [634] p. (731 p.)
- v. 2, 1862, art. 1-10, (1852-1860), [7] + 216 + 39 + 76 + [22] + 172 + [49] + 40 + 5 + [30] + 33 p. (689 p.)
- v. 3, 1862, art. 1- 4, (1858, 1860, 1861-62, 1859) [7 + 115 + 76 + 25 + 278] + 264 p. (765 p.)
- v. 4, 1862, art. 1- 2, (1861, 1862) [7] + [20 + 347 + 27 + 358] p. 30 illus. (759 p.)
- v. 5, 1864, art. 1- 3, (1863, 1862, 1862) [7] + 658 + 52 + 56 p. (773 p.)
- v. 6, 1867, art. 1- 4, (1862, 1864, 1863, 1866) [7 + 245 + 371 + 81 + 179 p. 7 pl. 3 illus. (883 p.)
- v. 7, 1867, art. 1-12, (1863 - 1867), [7 + 23 + 85] + [9 + 161 + 8 + 120 + 62 + 91 + 45] + 34 + 42 + [55] + 60 + 54 + 11 p. 676 illus. (867 p.)

ANNUAL REPORTS (R.)

Dates of Publication

- v. 1, for 1846, pub. 1847, 38 p.
- v. 2, 1847, 1848, 208 p.

v. 3,	1848,	1849, 64 p.
v. 4,	1849,	1850, 272 p.
v. 5,	1850,	1851, 326 p.
v. 6,	1851,	1852, 104 p.
v. 7,	1852,	1853, 96 p.
v. 8,	1853,	1854, 310 p.
v. 9,	1854,	1855, 464 p., 4 illus.
v. 10,	1855,	1856, 440 p., 79 illus.
v. 11,	1856,	1857, 468 p., 69 illus.
v. 12,	1857,	1858, 438 p., 100 illus.
v. 13,	1858,	1859, 448 p., 48 illus.
v. 14,	1859,	1860, 450 p., 55 illus.
v. 15,	1860,	1861, 448 p., 73 illus.
v. 16,	1861,	1862, 464 p., 25 illus.
v. 17,	1862,	1863, 446 p., 94 illus.
v. 18,	1863,	1864, 420 p., 56 illus.
v. 19,	1864,	1865, 450 p., 50 illus.
v. 20,	1865,	1866, 496 p., 137 illus.

Papers on Natural History

1847 OWEN, D. D. Report on the Baltimore County quarries. R. v. 2, p. 25-33. Submitted Mar. 11.

———. Report on the sandstones of the Potomac. R. v. 2, p. 36-40.

Both this and the preceding report were concerned with a survey of the materials to be used in the construction of the Smithsonian buildings.

SQUIER, E. G., and DAVIS, E. H. Ancient monuments of the Mississippi Valley: comprising the results of extensive original surveys and explorations. S. C. v. 1, art. 1, pref. p. 17-39 + 306 p. 48 pl. 207 illus. plans. Acc. in June. (Pub. no. 1)

ch. 16—Metals, fossils, minerals, etc., of the mounds, p. 278-88.

ch. 17—Crania from the mounds, p. 288-93, pl. 47-48.

Pub. in 1848.

Volume rev. in North. Amer. Rev. v. 68, p. 466-96. April, 1849.

Also rev. in Amer. J. Sc. ser. 2, v. 11, p. 305-24. May, 1851.

GRAY, Asa. Detailed account of the botanical explorations in New Mexico and California. R. v. 4, p. 16, 23-4.

AGASSIZ, Louis. Relative to the formation of a Museum . . . R. v. 4, p. 20, 24-6.

SQUIER, E. G. Aboriginal monuments of the state of New York, comprising the results of original surveys and explorations; with an illustrative appendix. S. C. v. 2, art. 9, 188 p. Pub. in 1850. 14 pl. 72 illus. Acc. Oct. 20. (Pub. no. 15)

GIBBES, R. W. A memoir on Mosasaurus and the three allied new genera, *Holcodus*, *Conosaurus*, and *Amphoroosteus*. S. C. v. 2, art. 5, 13 p. 3 pl. [28 fig.] Rec. Nov. 15. (Pub. no. 14)

Note, p. 13, dated Nov. 1, 1850. Pub. Nov. 1850.

Rd before Amer. Assoc. Adv. Sc. (1848), Aug. 14, 1849.

In its Proc. v. 2, p. 77, (pub. 1850).

- 1849 ELLET, Charles, Jr. Contributions to the physical geography of the United States; part 1: On the physical geography of the Mississippi Valley, with suggestions for the improvement of the navigation of the Ohio and other rivers. S. C. v. 2, art. 4, 64 p. 1 pl. Acc. in Dec. (Pub. no. 13).

Rec. Sept. 17, 1849, and Pub. in 1850.

- 1850 GRAY, Asa. *Plantae Wrightianae Texano—Neo-Mexicanae*; [An account of a collection of plants made by Charles WRIGHT in an expedition from Texas to El Paso, New Mexico, in the summer and autumn of 1849 . . .], part. 1. S. C. v. 3, art. 5, 146 p. 10 pl. [127 fig.] Acc. in Mar. (Pub. no. 22).

Preface written May, 1850. Pub. Mar. 1852. 418 species enumerated. Index, p. 131-42.

Pt. 2, acc. in Oct. 1852 (q.v. below).

See also U. S. & Mexican Boundary Surv. (1848).

AGASSIZ, Louis. The classification of insects from embryological data. S. C. v. 2, art. 6, 28 p. illus. 1 pl. [23 fig.] Rec. Mar. 6. (Pub. no. 16).

Rd before Amer. Assoc. Adv. Sc. (1848), Aug. 1849.

Not noted in its Proc.

WHITTLESEY, Charles. Descriptions of ancient works in Ohio. S. C. v. 3, art. 7, 20 p. 7 pl. Acc. in May. (Pub. no. 37).

Pub. in 1852. Preface written April 3, 1850.

Carried on during the operations of the Ohio Geol. Surv. (1837), q. v.

TORREY, John. *Plantae Frémontianae*; or, Descriptions of plants collected by Col. J. C. Frémont in California. S. C. v. 6, art. 1, 24 p. 10 pl. [89 fig.] Acc. in Sept. (Pub. no. 46.)

Pub. April, 1853. Includes the species collected on Frémont's 4 Expeditions (3 of which were Federal).

See also Frémont's Exped. to Missouri River & Rocky Mountains (1842); Frémont's Exped. to Oregon & California (1843) & Frémont's Exped. to California (1845).

Rev. in Amer. J. Sc. ser. 2, v. 16, p. 424-25. Nov. 1853.

See also Torrey's paper rd before Amer. Assoc. Adv. Sc. (1848), Aug. 22, 1850. In its Proc. v. 4, p. 190-93. Pub. 1851.

———. On the *Darlingtonia Californica*, a new pitcher-plant from northern California. S. C. v. 6, art. 3, [8 p.] 1 pl. [9 fig.] Acc. in Sept. (Pub. no. 61.)

See also Wilkes Explor Exped. (1838), v. 16.

Collected by W. D. Brackenridge.

Pub. in April, 1853. Rev. in Amer. J. Sc. ser. 2, v. 16, p. 425. Nov. 1853.

———. Observations on the *Batis maritima* of Linnaeus. S. C. v. 6, art. 2, 8p. 1 pl. [21 fig.] Acc. in Sept. (Pub. no. 60). Pub. April, 1853.

GIRARD, Charles. Contributions to the natural history of the fresh water fishes of North America; [part] 1: A monograph of the Cottoids. S. C. v. 3, art. 3, 80 p. 3 pl. [71 fig.] Acc. in Dec. (Pub. no. 30.)

Pub. Dec. 1851. Bibliography, p. 72-4.

ch. 1 On the fresh water cottoids in general, p. [5]-13.

2 Anatomical observations, p. 14-32.

3 On the genus *Cottus*, Artdi, p. 33-60.

4 On the genus *Cottopsis*, G., p. 61-3.

5 On the genus *Trigloporus*, G., p. 64-7.

BAILEY, J. W. Microscopical observations made in South Carolina, Georgia and Florida. S. C. v. 2, art. 8, 48 p. 3 pl. [83 fig.] tab. Acc. Dec. 1. (Pub. no. 23.)

p. 45-6, appx.: Microscopical forms found near Salem, Mass., by T[imothy] COLE.

Pub. Jan. 1851.

———. Microscopical examination of the soundings, made by the U. S. Coast Survey off the Atlantic Coast of the United States. S. C. v. 2, art. 3, 15 p. 1 pl. [68 fig.] Rec. Dec. 24. (Pub. no. 20.)

Pub. Jan. 1851. Sent to Coast Surv. Mar. 8, 1848. Originally pres. to Amer. Assoc. Geo. & Nat. (1840), in 1846.

BAIRD, S. F. Report of the Assistant Secretary in charge of the natural history department . . . for the year 1850. R. v. 5, p. 41-50.

1851 CULBERTSON, Thomas. Journal of an expedition to the Mauvais Terres and the Upper Missouri in 1850 . . . R. v. 5, p. 84-145.

From April 27 to July 6, 1850. Contains also:

PORTER, T. C. List of plants collected by Mr. Culbertson. p. 133-36.

HARRIS, Edward. List of birds and mammalia found on the Missouri River from Fort Leavenworth to Fort Union, at the mouth of the Yellowstone River . . . p. 136-38.

CULBERTSON, Thomas. A tabular view of the Indian tribes of the Upper Missouri in 1850. p. 138-39.

*HARVEY, W. H. Nereis Boreali-Americana; or, Contributions to a history of the marine algae of North America; part 1: Melanospermeae. S. C. v. 3, art. 4, 150 p. 12 pl. [32 fig.] Acc. in July. (Pub. no. 32.)

Pt. 2 acc. July, 1852 (q. v. below).

Pt. 3 acc. Sept. 1857 (q. v. below).

Pt. 1, Preface written Aug. 6, 1851. Pub. Jan. 1852. Rev. in Amer. J. Sc. ser. 2, v. 14, p. 1-8. July, 1852, by Asa Gray.

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3. Laminariaceae, p. 80-99.

4. Dictyotaceae, p. 99-121.

5. Chordariaceae, p. 121-32.

6. Ectocarpaceae, p. 133-44.

DAVIS, C. H. The law of deposit of the flood tide: its dynamical action and office . . . S. C. v. 3, art. 6, 13 p. Acc. in Dec. (Pub. no. 33). Pub. in 1852.

1851 LEIDY, Joseph. A flora and fauna within living animals. S. C. v. 5, art. 2, 68 p. 10 pl. [140 fig.] Acc. in Dec. (Pub. no. 44). Pub. April 1853.

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ch. 1: Description of a flora within animals, p. [17]-40.

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3: Upon Pseudo-Entophyta, etc., p. 50-4.

BAIRD, S. F. Report of the Assistant Secretary in charge of the Museum. R. v. 6, p. 39-65.

Appx. A: An account of the natural history explorations in the U. S. during 1851. p. 52-6.

1852. WYMAN, Jeffries. Anatomy of the nervous system of *Rana pipiens*. S. C. v. 5, art. 4, 52 p. 2 pl. [29 fig.] Acc. in May. (Pub. no. 45.) Pub. Mar. 1853. Rev. in Amer. J. Sc. ser. 2, v. 16, p. 251-60. Sept. 1853.

*HARVEY, W. H. Nereis Boreali-Americana; or, Contributions to a history of the marine algae of North America; [part] 2: Rhodospermeae. S. C. v. 5, art. 5, 258 p. 24 col. pl. [67 fig.] Acc. in July. (Pub. no. 43.)

Pub. Mar. 1853. Preface written Nov. 24, 1852.

Pt. 1, acc. July, 1851 (above, q. v.).

Pt. 3, acc. Sept. 1857 (below, q. v.).

Pt. 2, rev in Amer. J. Sc. ser. 2, v. 16, p. 422-24. Nov. 1853, by Asa Gray.

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LEIDY, Joseph. Memoir on the extinct species of American ox. S. C. v. 5, art. 3, 20 p. 5 pl. [15 fig.] Acc. in Sept. (Pub. no. 45). Pub. Dec. 1852.

GRAY, Asa. Plantae Wrightianae Texano-Neo-Mexicanae; [An account of a collection of plants made by Charles WRIGHT in western Texas, New Mexico and Sonora in the years 1851 and 1852; part 2. S. C. v. 5, art. 6, 119 p. 4 pl. [39 fig.] Acc. in Oct. (Pub. no. 42.)

Pub. Feb. 1853. Pt. 1 acc. Mr. 1850 (q. v. above).

See also U. S. & Mexican Boundary Surv. (1848).

BAIRD, S. F., and GIRARD, Charles. Catalogue of North American reptiles in the Museum of the Smithsonian Institution: part 1—Serpents. M. C. v. 2, art. 5, 16+172 p. Acc. in Nov. (Pub. no. 49.)

Pub. Jan. 1853. Appx. C.: Species collected by John H. Clark and Arthur Schott, on the U. S. & Mexican Boundary Survey, under Major Wm. H. Emory, and received too late for insertion in their proper places. p. 156-61.

See also U. S. & Mexican Boundary Surv. (1848).

LEIDY, Joseph. The ancient fauna of Nebraska; or, A description of remains of extinct Mammalia and Chelonia from the Mauvais Terres of Nebraska. S. C. v. 6, art. 7, 126 p. illus. 24 pl. [150 fig.] map. Acc. in Dec. (Pub. no. 58.)

Pub. June, 1853. Abstr. in R. v. 6, p. 63-5. (appx. E.)

CONTENTS:

Introduction, p. 1-18.

Mammalia, p. 19-99.

ch. 1 Descriptions of Ungulata paridigitata, p. 19-66.

2 Descriptions of Ungulata imparidigitata, p. 67-94.

3 Carnivora, p. 95-9.

Chelonia, p. [101]-11.

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3d ed. pub. Mar. 1859.

- 1853 STIMPSON, William. Synopsis of the marine Invertebrata of Grand Manan; or, The region about the mouth of the Bay of Fundy, New Brunswick. S. C. v. 6, art. 5, [67 p.] 3 pl. [37 fig.] Acc. in Jan. (Pub. no. 50.)

Pub. March, 1853.

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- 1854 MARSH, G. P. The camel. R. v. 9, p. 98-122.

FROEBEL, Julius. Remarks contributing to the physical geography of the North American continent. R. v. 9, p. 272-81. Written Dec. 8.

STRANG, J. J. Some remarks on the natural history of Beaver Islands, Michigan. R. v. 9, p. 282-88.

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Pub. July, 1856. Rev. in North Amer. Rev. ser. 2, v. 35, p. 205-23. July, 1857.

ch. 1. General opinions respecting the origin of population in the New World, p. 3-16.

2. Progress of investigation in the United States. p. 17-140.

3. Conclusion. p. 141-59.

*HARVEY, W. H. Substance of a course of lectures on marine algae. R. v. 10, p. 87-130.

MORRIS, J. G. Natural history as applied to farming and gardening: a lecture. R. v. 10, p. 131-35.

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- 1856 HITCHCOCK, Edward. Illustrations of surface geology. S. C. v. 9, art. 3, 8 + 155 p. 12 pl. 59 fig. 5 maps. sect. tab. Acc. in Jan. (Pub. no. 90.)

Pub. April, 1857. See also MERRILL, (1) p. 462-63. (See Annot. Bib.). Also in his First 100 yrs. Amer. Geol. 1924, p. 343-44. 2d ed. N. Y., D. Appleton & co., & Amherst, Mass., J. S. & C. Adams, 1860. 1st ed. rev. in Amer. J. Sc. ser. 2, v. 24, p. 430-33. Nov. 1857, by J. D. Dana.

CONTENTS:

Pt. 1. On surface geology, especially that of the Connecticut Valley in New England, p. 1-78.

Pt. 2. On the erosions of the earth's surface, especially by rivers, p. 79-127.

Pt. 3. Traces of ancient glaciers in Massachusetts and Vermont, p. 129-44.

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“Being an account of the geographical distribution of the birds of North America during their breeding season, with figures and descriptions of their eggs.”

Raptores, p. 1-81. Fissirostres, p. 82-112.

JONES, Joseph. Investigations chemical and physiological relative to certain American Vertebrata. S. C. v. 8, art. 5, [138 p.] 27 illus. Acc. in Mar. (Pub. no. 82). Pub. in July, 1856.

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*SAWKINS, James, and *WALL, G. P. Report of progress, from August 25, 1856, to February 24, 1857, of the survey of the economic geology of Trinidad. R. v. 11, p. 281-88.

BAIRD, S. F. Report of Assistant Secretary . . . R. v. 11, p. 47-68.

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Pub. Jan. & Apr. 1858. Bibliography, pref p. 11-8.

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Preface written Dec. 1, 1857. Pub. Mar. 1858.

Pt. 1, acc. in July, 1851 (q. v.)

Pt. 2, acc. in July, 1852 (q. v.)

Pt. 3, rev. in Amer. J. Sc. ser. 2, v. 27, p. 142-46. Jan. 1859.

CONTENTS:

- Order 1. Siphoneae, p. 9-33.
2. Dasycladeae, p. 33-40.
3. Valoniaceae, p. 41-51.
4. Ulvaceae, p. 51-61.
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6. Confervaceae, p. 67-92.

- 7. Zygnemaceae, p. 92-3.
- 8. Hydrodictyeae, p. 94-5.
- 9. Oscillatoriaceae, p. 96-109.
- 10. Nostochineae, p. 110-15.
- 13. Palmellaceae, p. 116-19.

Supp. to Pt. 1-3, p. 121-31.

- 1858 BOWEN, T. J. . . . Grammar and dictionary of the Yoruba language, with an introductory description of the country and people of Yoruba. S. C. v. 10, art. 4, 23 + 71 + 136 p. map. Acc. in May. (Pub. no. 98.)
 Pref. 21 p. gives descriptions of people and the country.

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COOPER, J. G. On the distribution of the forests and trees of North America, with notes on its physical geography. R. v. 13, p. 246-80.

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- 1859 MORRIS, J. G. Catalogue of the described Lepidoptera of North America, prepared for the Smithsonian Institution. M. C. v. 3, art. 2, 8 + 68 p. Acc. Oct. 1. (Pub. no. 118.)

Pub. May, 1860, Preface dated Mar. 1860. Bibliography, pref. p. 5-7.

LE CONTE, J. L. The Coleoptera of Kansas and eastern New Mexico. S. C. v. 11, art. 6, 6 + 58 p. 2 pl. [33 fig.] map. Acc. in Oct. (Pub. no. 136.)

Pub. Dec. 1859. See also Pacific R.R. Surv. (1853).

Williamson's Exped., v. 5, & Pope's Exped., v. 2.

BAIRD, S. F. Catalogue of North American birds, chiefly in the museum of the Smithsonian Institution. M. C. v. 2, art. 4, 22 p. (Pub. no. 108). Pub. 1859. (Oct. 1858.)

Repr. with some changes from that in v. 9 of Pacific R.R. Surv. (1853), q. v.

*CARPENTER, P. P. Lectures on the shells of the Gulf of California. R. v. 14, p. 195-219, illus.

BAIRD, S. F. Report of the Assistant Secretary . . . R. v. 14, p. 54-78. Written Dec. 31.

1860 HENRY, Joseph. Circular to officers of the Hudson's Bay Company. M. C. v. 2, art. 8, 5 p. (Pub. no. 137.)

Written April 20, 1860.

———. Instructions in reference to collecting nests and eggs of North American birds. M. C. v. 2 art. 9, p. 1-9. (Pub. no. 139.)

Written Jan. 1, 1860 & pub. Jan. 1860.

———. Circular in reference to the history of North American grasshoppers. M. C. v. 2, art. 9, 4 p. (Pub. no. 139.)

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*NEWTON, Alfred. Suggestions for forming collections of birds' eggs. M. C. v. 2, art. 9, p. 10-22, illus. (Pub. no. 139). Pub. in Jan. 1860.

LEA, Isaac, *CARPENTER, P. P., STIMPSON, William, and PRIME, Temple. Checklists of the shells of North America . . . prepared for the Smithsonian Institution. M. C. v. 2, art. 6, 5 + [44 p.] (Pub. no. 128.)

Pub. June, 1860. Contains:

no. 1. *CARPENTER, P. P. West coast: Oregonian and Californian province. 4 p. (a)

2. ———. West coast: Mexican and Panamic province. 13 p. (b)

3. STIMPSON, William. East coast: Arctic Seas to Georgia. 6 p. (c)

4. Not published.

5 & 6. BINNEY, W. G. Terrestrial and fluviatile Gasteropoda. 13 p. (e & f)

7. PRIME, Temple. Cyclades. 2 p. (g)

8. LEA, Isaac. Unionidae. 6 p. (h)

MITCHELL, S. W. Researches upon the venom of the rattlesnake, with an investigation of the anatomy and physiology of the organs concerned. S. C. v. 12, art. 6, [9 + 145 p.] 12 illus. Acc. in July. (Pub. no. 135.)

Pub. in 1861. Bibliography, Appx. B, p. [127]-39. Contains also as Appx. A.:

COPE, E. D. An enumeration of the genera and species of rattlesnakes with synonymy and references. p. [119]-26.

Digest of Mitchell's Paper in R. v. 15, p. 23-6, 1860.

LE CONTE, J. L. Classification of the Coleoptera of North America prepared for the Smithsonian Institution; part 1. M. C. v. 3, art. 3, 25 + 286 p. illus. Acc. in Oct. (Pub. no. 136.)

p. 1-208 pub. May, 1861; p. 209-78 pub. in Mar. 1862.

MORRIS, J. G. Synopsis of the described Lepidoptera of North America; part 1: Diurnal and crepuscular Lepidoptera, compiled for the

Smithsonian Institution. M. C. v. 4, art. 2, 27 + 358 p. 30 illus. Acc. in Oct. (Pub. no. 133). Pub. in Feb. 1862.

*HAGEN, Hermann. Synopsis of the Neuroptera of North America with a list of the South American species, prepared for the Smithsonian Institution. M. C. v. 4, art. 1, 20 + 347 p. Acc. in Nov. (Pub. no. 134.)

Pub. July, 1861. Bibliography, pref. p. 11-7.

*CARPENTER, P. P. Lectures on Mollusca; or, "Shell-fish" and their allies. R. v. 15, p. 151-283.

*NEWTON, Alfred. Suggestions for saving parts of the skeleton of birds. R. v. 15, p. 417-21, illus.

VOLLUM, E. P. Notes on the wingless grasshopper of Shasta and Fall River Valleys, California, and a plan for keeping them out of fields. R. v. 15, p. 422-25, illus.

WURDEMAN, Gustavus. Letter relative to the obtaining of specimens of flamingoes and other birds from South Florida. R. v. 15, p. 426-30.

Written April 27, 1857.

GESNER, W[illia]m. On the habits of the pouched rat, or salamander (*Geomys Pineti*), of Georgia. R. v. 15, p. 431-33.

BARNARD, Vincent. A catalogue of birds of Chester County, Pa., with their times of arrival in spring, from observations annually for ten successive years. R. v. 15, p. 434-38.

COOPER, J. G. On the forests and trees of Florida and the Mexican Boundary. R. v. 15, p. 439-42.

BAIRD, S. F. Report of the Assistant Secretary . . . R. v. 15, p. 55-85. Written Dec. 31.

1861 *LOEW, H[ermann], and *OSTEN-SACKEN, R. von. Monographs of the Diptera of North America, prepared for the Smithsonian Institution, by H. Loew; edited by R. von Osten-Sacken: part 1. M. C. v. 6, art. 1, 24 + 221 p. 2 pl. [42 fig.] Acc. in July. (Pub. no. 141.)

Pub. April, 1862. Preface written Oct. 3, 1860.

———. Same; part 2. M. C. v. 6, art. 2, 11 + 360 p. 5 pl. [44 fig.] Acc. in July. (Pub. no. 171.)

Pub. Jan. 1864.

COUES, Elliott, and PRENTISS, Webster. List of birds ascertained to inhabit the District of Columbia, with the times of arrival and departure of such as are non-residents and brief notices of habits, etc. R. v. 16, p. 399-421.

226 species enumerated.

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GRAY, Asa. Enumeration of a collection of dried plants made by L. J. Xantus at Cape San Lucas in Lower California, between August, 1859, and February, 1860, and communicated to the Smithsonian Institution.

Rd before Amer. Acad. A. & Sc. (1780), Jan. 30, 1861. In its Proc. v. 5, p. 153-73. 1861.

- 1862 WHITTLESEY, Charles. Ancient mining on the shores of Lake Superior. S. C. v. 13, art. 4, 3 + 29 p. illus. sect. map. Acc. in April. (Pub. no. 155.)
 Written May 1, 1856. Pub. April, 1863.
- WILSON, Daniel. Lectures on physical ethnology. R. v. 17, p. 240-302, illus.
 Pt. 1. The American cranial type, p. 240-65.
 2. Designed and undesigned sources of change in cranial forms, p. 265-91.
 3. Primitive art—races, p. 291-302.
- BAIRD, S. F. Report of the Assistant Secretary . . . R. v. 17, p. 46-59. Written Dec. 31.
- 1863 BINNEY, W. G. Bibliography of North American conchology, previous to the year 1860, prepared for the Smithsonian Institution; part 1: American authors. M. C. v. 5, art. 1, 7 + 650 p. (Pub. no. 142.)
 Pub. Mar. 1863. See annotation under ANNOTATED BIBLIOGRAPHY: BINNEY, William Greene.
- MITCHELL, S. W., and MOREHOUSE, G. R. Researches upon the anatomy and physiology of respiration in the Chelonia. S. C. v. 13, art. 9, [8] + 42 p. 8 illus. Acc. in Mar. (Pub. no. 159). Pub. April, 1863.
- LE CONTE, J. L. New species of North American Coleoptera prepared for the Smithsonian Institution; part 1. M. C. v. 6, art. 4, 2 + 177 p. (Pub. no. 167.)
 p. 1-86 pub. Mar., 1863; p. 87-163, pub. April, 1866.
- GIBBS, George. Instructions for research relative to ethnology and philology of America prepared for the Smithsonian Institution. M. C. v. 7, art. 11, 51 p. (Pub. no. 160.)
 Ethnology, p. 2-12, 35-9. Pub. in Mar.
- LE CONTE, J. L. List of the Coleoptera of North America, prepared for the Smithsonian Institution; part 1. M. C. v. 6, art. 3, 3 + 78 p. (Pub. no. 140.)
 p. 1-49, pub. Mar. 1863; p. 50-70, in Apr. 1866.
- EGLESTON, T[homas]. Catalogue of minerals with their formulas, etc., prepared for the Smithsonian Institution. M. C. v. 7, art. 9, 13 + 42 p. (Pub. no. 156). Pub. June, 1863.
- BAIRD, S. F. Report of the Assistant Secretary . . . R. v. 18, p. 44-63. Written Dec. 31.
- PEALE, T. R. Method of preserving Lepidoptera. R. v. 18, p. [404]-6, illus.
- *MORAO, Figanierre E. An account of a remarkable accumulation of bats near Charleston, Cecil Co., Md. R. v. 18, p. [407]-9.
- 1864 MEEK, F. B. Check-list of the invertebrate fossils of North America: Cretaceous and Jurassic. M. C. v. 7, art. 8, 2 + 40 p. (Pub. no. 177). Pub. in April, 1864.
- MEEK, F. B., and HAYDEN, F. V. Palaeontology of the Upper Missouri: A report upon the collections made principally by the expeditions under

the command of Lt. G. K. Warren, U. S. T. E., in 1855 and 1856; part 1: Invertebrates. S. C. v. 14, art. 5, 9 + [146 p.] 5 pl. [55 fig.] Acc. in May. (Pub. no. 172). Pub. Feb. 1864-Mar. 1865.

See also Warren's Sioux Exped. (1855).

See also Warren's Explor. in Nebraska & Dacotah (1856).

p. 1-10, Silurian age; 11-65, Carboniferous age; 66-128, Reptilian age.

p. 1-16, pub. Feb. 1864; p. 17-24, Mar., p. 25-32, Feb.; p. 33-48, Apr., p. 49-56, 65-72, June; p. 57-64, May; p. 73-96, Sept., p. 97-112, Dec. 1864; p. 113-28, Jan. 1865; p. 129-46, Mar. 1865.

WHITTLESEY, Charles. On the freshwater glacial drift of the north-western states. S. C. v. 15, art. 3, [4] + 32 p. illus. sect. map. Acc. in June. (Pub. no. 197.)

p. 1-16, pub. Apr. 1866 & p. 17-32, pub. May, 1866.

ALLEN, H[arrison]. Monograph of the bats of North America. M. C. v. 7, art. 1, 23 + 85 p. 68 illus. (Pub. no. 165). Pub. June, 1864.

See revision of this article in U. S. Nat. Mus. Bull. no. 43. Wash. 1893. 198 p. 38 pl.

MEEK, F. B. Check-list of the invertebrate fossils of North America: Miocene. M. C. v. 7, art. 7, 2 + 32 p. (Pub. no. 183). Pub. Nov. 1864.

RAU, Charles. Artificial shell-deposits in New Jersey. R. v. 19, p. 370-74, illus.

BAIRD, S. F. Report of the Assistant Secretary . . . R. v. 19, p. 74-100.

FEILNER, John. Exploration in Upper California in 1860 under the auspices of the Smithsonian Institution. R. v. 19, p. 421-30.

LEIDY, Joseph. Cretaceous reptiles of the United States; [Mémorial on the extinct reptiles of the Cretaceous formations of the United States]. S. C. v. 14, art. 6, 3 + 135 p. 20 pl. [309 fig.] Acc. in Dec. (Pub. no. 185.)

Pub. May, 1865. p. 1-8, pub. Feb., 1865; p. 9-32, Mar., p. 33-128, Apr., p. 129-35, May, 1865.

HOY, P. R. Journal of an exploration of western Missouri in 1854 under the auspices of the Smithsonian Institution. R. v. 19, p. 431-38.

1865 STIMPSON, William. Researches upon the Hydrobiinae and allied forms; chiefly made upon materials in the Museum of the Smithsonian Institution. M. C. v. 7, art. 4, 3 + 59 p. illus. (Pub. no. 201.)

Pub. May-Aug., 1865. p. 1-32, pub., May; p. 33-59, June & Aug.

BINNEY, W. G. Land and freshwater shells of North America; part 2 . . . M. C. v. 7, art. 2, 9 + 161 p. 261 illus. (Pub. no. 143.)

Pub. in Sept., 1865. Pt. 2 contains the Pulmonata limnophila and thalassophila.

See next entry for Pt. 3.

- . Land and freshwater shells of North America; part 3 . . .
M. C. v. 7 art. 3, 8 + 120 p. 232 illus. (Pub. no. 144.)
Pub. in Sept., 1865. Pt. 3 contains the Ampullariidae, Valvatidae,
Viviparidae, freshwater Rissoidae, Cyclophoridae, Truncatellidae,
freshwater Neritidae, Helicinidae.
- PRIME, Temple. Monograph of American Corbiculadae, (recent and
fossil) prepared for the Smithsonian Institution M. C. v. 7, art. 5,
11 + 80 p. 86 illus. (Pub. no. 145). Pub. in Dec., 1865.
- BAIRD, S. F. Report of the Assistant Secretary . . . R. v. 20, p. 75–
88. Written Dec. 31.
- . Duplicate shells collected by the United States Exploring
Expedition under Capt. C. Wilkes. Wash. 1865. 4 p.
See also Wilkes Explor. Exped. (1838), v. 12.
- 1866 PUMPELLY, Raphael. Geological researches in China, Mongolia, and
Japan during the years 1862–1865. S. C. v. 15, art. 4, 7 + 161 p. 9 pl.
illus. sect. maps. (Pub. no. 202.)
Pub. Apr.–Aug., 1866. See also MERRILL, (1) p. 522–23. (See
Annot. Bib.). Also in his First 100 yrs Amer. Geol. 1924. p. 419–
20. Preface written Aug. 1, 1866. p. 1–32, pub. Apr., p. 33–80,
May; p. 81–96, June; p. 97–128, July; p. 129–61, Aug.
Contains in Appx. 1:
NEWBERRY, J. S. Descriptions of fossil plants from the Chinese
coal-bearing rocks. p. 119–23. Written Sept. 25, 1865.

WISLIZENUS'S TOUR TO NORTHERN MEXICO (1846)

History

“Dr. Adolphus Wislizenus undertook this scientific tour to northern Mexico at his private expense. Leaving St. Louis in the spring of 1846 (May 4), he followed the Santa Fe road by the Cimarron route to Santa Fe. Thence he went down the Rio Grande Valley to El Paso and Chihuahua. Here the derangement which the Mexican War produced, kept him in a passive condition for six weeks. On Colonel Doniphan's arrival in that neighborhood, he accepted a situation in the medical department of the Army and returned with the troops by way of Monterey to the states (June 10, 1847).” WARREN, G. K. Pacific R.R. Surv. v. 11, p. 55. 1859.

Wislizenus's report was published in 1848. Botanical collections were made by Dr. Gregg, which were described by George Engelmann. See also MERRILL (1), p. 398 for criticism of the geology in the report. Also in MERRILL, First 100 yrs Amer. Geol. 1924. p. 256–57, port.

Report

- 1848 WISLIZENUS, [Adolphus]. . . . Memoir of a tour to northern Mexico, connected with Col. Doniphan's Expedition in 1846 and 1847, with a scientific appendix and three maps. Washington, Tappin & Streeper, 1848. 141 p. 3 maps. tab. (In U. S. 30th Cong., 1st sess., Sen. Misc. Doc. no. 26). Serial no. 511.

Rev. in Amer. J. Sc. v. 56 (ser. 2, v. 6), p. 376-92. Nov. 1848.
Also rev. in Western Journal & Civilian. St. Louis, July, 1848. v. 1, p. 363-81.

Engelmann's Botanical Report repr. in his Reprint of Papers. St. Louis, 1887. p. 39-58.

CONTENTS:

- p. 3- 4 WISLIZENUS [Adolphus]. Introduction.
p. 5- 86 —————. Memoir.
p. 87-115 ENGELMANN, George. Botanical appendix. Written Dec. 1847.
p. 116- 33 WISLIZENUS [Adolphus]. Meteorological tables.
p. 135- 38 —————. Geological sketch.
p. 139- 41 —————. Maps, etc.

LYNCH'S DEAD SEA EXPEDITION (1847)

History

Lieut. W. F. Lynch was authorized to make an examination of the Dead Sea on Sept. 30, 1847. His party sailed from New York, Nov. 26, 1847. In Beirut he engaged Henry James Anderson, of New York, as physician to the expedition; and as geologist during the course of the expedition to, and exploration of, the Dead Sea. The examination continued through July, 1848.

Lynch's Report was rendered Feb. 3, 1849, and was published the same year. He also published a Narrative of the trip for popular use. The birds collected were described by John Cassin, and the botany was reported and collected by R. E. Griffith.

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Charles Wilkes . . . in 1838 . . . and 1842 . . . and an account of the Expedition to the Dead Sea under Lieutenant Lynch . . . Auburn, N. Y., James Alden, 1850. 517 p.

Another ed., Rochester & Auburn, N. Y. 1857. 517 p.

Report

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Rept. rev. in Amer. J. Sc. v. 58 (ser. 2, v. 8), p. 317-33. Nov. 1849, by Benjamin Silliman. See above, Bibliography, for Lynch's Narrative.

CONTENTS:

- p. 1-45 LYNCH, W. F. Report.
 p. 27-8 Instructions to Dr. Anderson, geologist in charge.
 p. 46- 8 CASSIN, John. Ornithological report.
 p. 49-71 GRIFFITH, R. E. Botanical report: catalogue of the plants collected in Syria and Palestine.
 p. 73-88 LYNCH, W. F. Astronomical observations.

OWEN'S SURVEY OF THE CHIPPEWA LAND DISTRICT OF WISCONSIN (1847)

History

During August, September and October, 1847, David Dale Owen, assisted by J. G. Norwood, conducted a geological reconnaissance of the Chippewa Land District of Wisconsin. His Report was rendered April 23, 1848, and published the same year. For critical estimate of the geology of the Report, see also MERRILL, (1), p. 411-13. (See Annot. Bib.). This Reconnaissance was the forerunner of OWEN'S SURVEY OF WISCONSIN, IOWA & MINNESOTA (1848), q. v. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 271-73.

Bibliography

- 1847 OWEN, David Dale. Preliminary report containing outlines of progress of the geological survey of Wisconsin and Iowa up to October 11, 1847. Washington, 1847. (In U. S. 30th Cong., 1st sess., Sen. Ex. Doc. no. 2, p. 160-74). Serial no. 504.

Appx. L of the Ann. Rept. for 1847 of the U. S. General Land Office.

Report

- 1848 OWEN, David Dale. Report of a geological reconnoissance of the Chippewa land district of Wisconsin, and, incidentally, of a portion of the Kickapoo country, and of a part of Iowa and of the Minnesota Territory, made under instructions from the United States Treasury Department. Washington, 1848. 134 p. 23 pl. maps. tab. (In U. S. 30th Cong., 1st sess., Sen. Ex. Doc. v. 7, no. 57). Serial no. 509.

Rev. in Amer. J. Sc. v. 59 (ser. 2, v. 9), p. 306-7. Mar. 1850; & v. 60 (ser. 2, v. 10), p. 1-12. July, 1850.

CONTENTS:

- p. 3- 72 OWEN, D. D. Report.
- ch. 1 Formations of the Upper Mississippi. p. 9-32.
 - ch. 2 Formations of the Red Cedar River, of the Winnebago Reserve. p. 33-7.
 - ch. 3 Formations of the interior of the Chippewa Land District. p. 38-48.
 - ch. 4 Formation of Lake Superior. p. 49-67.
 - ch. 5 Drift of the interior of Wisconsin. p. 68-72.
- p. 73-129 NORWOOD, J. G. Report of the assistant geologist. April 23, 1848.
- p. 131- 34 OWEN, D. D. List of fossil genera collected.

JACKSON'S U. S. SURVEY OF THE MINERAL LANDS OF MICHIGAN (1847)

History

Under an act approved March 1, 1847, Charles Thomas Jackson was placed in charge of the survey of the U. S. mineral lands in the state of Michigan, which had formerly been under the supervision of the state geologist of Michigan, Douglass Houghton, (see MICHIGAN GEOL. SURV. (1837)), who was assisted by W. A. Burt and Bela Hubbard, during 1845 and 1846.

Jackson carried on his work, assisted by J. D. Whitney, J. W. Foster, John Locke, G. O. Barnes, Bela Hubbard, Wolcott Gibbs, Richard Copley, James McIntyre, G. J. Dickenson, W. W. Mather, Dennis Cooley, S. W. Hill, Edward Desor, William Schlatter, W. D. Whitney, William F. Channing, S. W. Higgins, Joseph Peabody, C. A. Joy, William A. Bernard, William Ives, George E. Smith, J. H. Mullet.

These men served for various periods through 1847 and 1848, and 1849. Jackson's Report including those of his assistants was rendered Nov. 10, 1849. Owing to some general disagreement with the federal authorities, Jackson resigned in 1849, and was succeeded by J. W. Foster & J. D. Whitney who rendered Reports in 1850 (see FOSTER & WHITNEY'S SURV. LAKE SUPERIOR LAND DISTRICT (1849)).

For critical notes on the geology of the Reports, see also MER-RILL, (1), p. 414-15. (See Annot. Bib.). See also his First 100 yrs Amer. Geol. 1924. p. 278-80.

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Reports by Bela Hubbard & W. A. Burt, p. 1-38.

See below REPORTS: p. 802-935, by BURT & HUBBARD.

- 1847 JACKSON, Charles Thomas, and others. Preliminary report . . . on the Mineral Lands of the United States in the state of Michigan . . . Washington, 1847. (In U. S. 30th Cong., 1st sess., Sen. Ex. Doc. no. 2, p 175-230). Serial no. 504.

Appx. M of Ann. Rept. U. S. Gen. Land Office for 1847.

p. 175- 83 JACKSON, C. T. Report . . . Oct. 27, 1847.

p. 183- 99 LOCKE, John. Report . . . Oct. 25, 1847.

p. 199-209 CHANNING, W. F. Report . . . Oct. 18, 1847.

p. 210- 19 MCNAIR, D. K. Report.

p. 221- 30 WHITNEY, J. D. Letter on the northern peninsula of Michigan.

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(1) House ed., Serial no. 571

- 1849 JACKSON, Charles T[homas]. Report on the geological and mineralogical survey of the mineral lands of the United States in the state of Michigan, made under the authority of an act of Congress, approved March 1, 1847, entitled: "An act to establish a land office in the northern part of Michigan, and to provide for the

sale of mineral lands in the state of Michigan." Washington, 1849. (In U. S. 31st Cong., 1st sess., H. Ex. Doc. v. 3, pt. 3, no. 5, p. 371-935, illus. 19 pl. 15 maps, tab. sect. prof.). Serial no. 571.

(2) Senate ed., Serial no. 551

———. Same . . . Wash. 1849. (In U. S. 31st Cong., 1st sess., Sen. Ex. Doc. v. 3, pt. 3, no. 1, p. 371-935, illus. 19 pl. 15 maps. tab. sect. prof.). Serial no. 551.

Report rev. in Amer. J. Sc. v. 61 (ser. 2, v. 11), p. 147-48. Jan. 1851.

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- p. 371-502 JACKSON, C. T. Report.
- p. 502- 6 DICKENSON, C. J. Report.
- p. 506- 9 MCINTYRE, J. M. Report.
- p. 509- 14 BARNES, G. O. Report.
- p. 515- 23 JACKSON, C. T. Meteorological and barometrical observations.
- p. 524- 60 MATHER, W. W. Report.
- p. 563- 72 LOCKE, John. Report: catalogue of specimens.
- p. 573-605 ———. Report.
- p. 605- 26 WHITNEY, J. D., and FOSTER, J. W. Synopsis of the explorations in the northern peninsula of Michigan. . . . (Made Nov. 5, 1849.)
Assisted by Messrs. Edward Desor, S. W. Hill, W. D. Whitney & William Schlatter.
- p. 627-701 BARNES, G. O. Field notes made in the Ontonagon district.
- p. 702- 12 GIBBS, Wolcott. Field notes.
- p. 712- 58 WHITNEY, J. D. Field notes, for 1847.
- p. 759- 65 FOSTER, J. W., and HILL, S. W. Statistics of the mines at Keweenaw Point.
- p. 766- 72 FOSTER, J. W. Report.
- p. 773-801 ———. Notes on the geology and topography of a portion of the country adjacent to Lakes Superior and Michigan in the Chippewa Land District. (Written May 26, 1849.)
- p. 802-935 BURT, W. A., and HUBBARD, Bela. Reports on the linear survey, with reference to mines and minerals in the northern peninsula of Michigan in the years 1845 and 1846.

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- p. 811- 32 BURT, W. A. Geological report on surveys of township lines in 1845.
- p. 833- 42 HUBBARD, Bela. Geological report on surveys of township lines in 1845
- p. 842- 75 BURT, W. A. Geological report . . . in 1846.

- p. 876- 82 COOLEY, Dennis. Catalogue of plants collected by W. A. Burt in the primitive region south of Lake Superior in 1846.
- p. 882- 98 HUBBARD, Bela. Geological report on subdivisional surveys of S. W. Higgins in 1846.
- p. 899-932 IVES, William, and HUBBARD, Bela. Geological report on surveys by William Ives in 1846.
- p. 933- 35 BURT, W. A. Catalogue of specimens collected in 1844.

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- 1849 JACKSON, C. T. On the geological structure of Keweenaw Point.
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- . Remarks on the geology, mineralogy and mines of Lake Superior.
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- JACKSON, C. T. Catalogue of rocks, minerals, and ores collected during the years 1847 and 1848 on the Geological Survey of the Mineral Lands (U. S.) in Michigan, by . . . and deposited in the Smithsonian Institution.
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ALABAMA GEOLOGICAL SURVEYS (1848)

History

“The first systematic examination into the structure of the state of Alabama was begun in 1847, by Michael Tuomey then professor of mineralogy, geology and agricultural chemistry in the University of Alabama. It was made the duty of that officer, at his appointment ‘to spend such portions of his time, not exceeding four months in each year, in exploring the state, in connection with his proper department, as the trustees may consider for the advantage of the state . . .’ ”

“Reports of this survey were made to the Board of Trustees and extracts from the same, which were thought to be of general

interest, were published in the Tuscaloosa newspapers. The interest excited by these published extracts led to the passage by the General Assembly of the State, in January, 1848, of resolutions appointing Prof. Tuomey, geologist to the state, and requiring him to lay before the General Assembly the full reports of his Geological Surveys and Explorations."

"The expenses of these explorations were borne by the University and the Report upon them was submitted to Governor Collier in December, 1849, which report was published at the cost of the state in 1850.

"Prof. Tuomey continued his explorations, the University of Alabama, still bearing the expense of the Survey until the passage by the General Assembly, in 1854, of an 'Act to provide for a geological and agricultural survey of the state,' by which the Governor was authorized to appoint a state geologist, and the sum of ten thousand dollars, exclusive of the salary of the state geologist, was appropriated for the purpose of employing assistants and defraying the incidental expenses of the survey.

"Prof. Tuomey received the appointment of state geologist, and early in 1854, took the field, in company with E. Q. Thornton, Esq., his assistant. Other assistants in field-work were Oscar M. Lieber, W. Echols Hollowell, and in Jan. 1855, Dr. John W. Mallett was appointed chemist to the survey.

"In the autumn of 1855, the second biennial report was submitted to the Legislature and ordered to be printed. The printing of the Report was delayed from various causes. Prof. Tuomey's death occurred in March, 1857, and upon Prof. Mallett devolved the duty of superintending the publication of the Report which appeared in 1858 . . ." SMITH, E. A. Rept. for 1874. Geol. Surv. Alabama. p. 9-10.

The Museum of the Survey was located at Tuscaloosa, and consisted of the collections made by Prof. Tuomey during the progress of the surveys between 1847 and 1857. They were destroyed by fire in 1865. For critical estimate of the geological contents of the Reports, see also MERRILL (1), p. 408-9. See also BIBLIOGRAPHY, below.

In addition to those noted above, Tuomey received assistance from J. P. Wier, George Powell, L. Richardson, Samuel S. Graham, J. M. Hale, and Messrs. Pybas & Deshler. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 266-69.

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Geologic map was pub. in 1853. Rev. in Amer. J. Sc. v. 60 (ser. 2, v. 10), p. 299-300. Sept. 1850.
Preface dated Dec. 20, 1849.

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pref. p. 9-13	Preface.
pref. p. 14-31	Introduction.
p. 1- 8, ch. 1	Primary & metamorphic rocks.
p. 8- 29, 2	Silurian or older fossiliferous rocks.
p. 29- 64, 3	Economical relations of the Red Mountain group.
p. 65- 93, 4	Carboniferous system.
p. 94-112, 5	Economic relations of the Carboniferous System.
p. 116- 42, 6	Cretaceous System.
p. 143- 69, 7	Tertiary System.
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- pref. p. 9-11 MALLEY, J. W. Editor's preface.
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 pref. p. 15- 9 TUOMEY, Michael. Introduction.
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 ch. 1 North Alabama. p 1-42.
 2 Metamorphic rocks of East Alabama. p. 43-78.
 3 Silurian rocks of Shelby, Benton & De Kalb Co. p. 79-93.
 4 Economic materials derived from the older rocks. p. 94-133.
 5 Cretaceous and Tertiary rocks of southeast Alabama. p. 134-57.
 6 Newer (Post-Tertiary) deposits.
 7 Physical features of Alabama. p. 158-68.
 p. 169-222, appx. 1 MALLEY, J. W. Report of the chemical department of the survey for the year 1855.
 p. 223- 52, appx. 2 THORNTON, E. Q. Reports on portions of the Cretaceous and Tertiary formations.
 p. 253- 75, appx. 3 TUOMEY, Michael, and MALLEY, J. W. Lists of Cretaceous and Tertiary fossils in Alabama and Mississippi.
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 p. 288- 89, Errata.
 p. 290- 92, appx. 5 Geological map.

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- 1857 MALLEY, J. W. Results of some analyses made for the Geological Survey of the State of Alabama.
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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (1848)

History

"In conformity with a resolution of the ASSOCIATION OF AMERICAN GEOLOGISTS & NATURALISTS (1840), q. v., adopted during its session at Boston, in September, 1847, that body agreed to resolve itself into the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, and that the first meeting under the new organization should be held in the city of Philadelphia, on the third Wednesday, (20th) day of September, 1848, and

agreeably to the arrangements and invitation of the local committee then appointed, the new Association held its first regular meeting this day, September 20, 1848, at the hour of 10 A. M. in the library room of the Academy of Natural Sciences (1812), q. v." From AMER. ASSOC. ADV. SC. Proc. v. 1, 1849, p. 5.

"The objects of the Association are, by periodical and migratory meetings to promote intercourse between those who are cultivating science in different parts of the United States; to give a stronger and more general impulse, and a more systematic direction to scientific research in our country, and to procure for the labors of scientific men, increased facilities and a wider usefulness." From the CONSTITUTION.

The Association during the period before the Civil War was divided into two large sections: the one comprising general physics, mathematics, chemistry, civil engineering, and allied sciences; the second embracing Natural History, which included geology, botany, zoology, anthropology, physiology and medicine.

A list of the meetings, dates, and officers of the annual congregations are given below. Of the fifteen meetings held between 1848 and 1861, eight were presided over by naturalists, namely: W. C. Redfield, Louis Agassiz, J. D. Dana, John Torrey, James Hall, J. W. Bailey, and Isaac Lea, and Jeffries Wyman (not present at 1858 meeting, of which he was presiding officer).

The scheduled Cleveland meeting for 1852 was prevented by an outbreak of cholera, and was postponed until the following year. In 1850 and 1851 two meetings were held during each year. The scheduled 1861 meeting at Nashville was postponed until the close of the Civil War, when the Association met at Buffalo, in 1866.

The business of and papers read before the Association were published in its PROCEEDINGS, beginning with 1849. The natural history contents with accompanying bibliographical data, may be found below under the PAPERS ON NATURAL HISTORY. In several instances, the cities in which the Association met, contributed in part or in whole to the expense of printing the Proceedings.

A number of the volumes contain many papers of which only the titles are recorded, and in some cases, brief abstracts. These are included in the "PAPERS" below, in order to give a general idea of the topics under discussion at the time.

Meetings, Dates, Officers, Etc.

Meeting	Date	Place	President
1	1848—Sept. 20-25	Philadelphia	W. C. Redfield
2	1848—Aug. 14-21	Cambridge	Joseph Henry
3	1850—Mar. 12-16	Charleston, S. C.	A. D. Bache
4	1850—Aug. 19-24	New Haven	A. D. Bache
5	1851—May 5-9	Cincinnati	A. D. Bache
6	1851—Aug. 19-24	Albany, N. Y.	Louis Agassiz
7	1853—July 28-Aug. 2	Cleveland	Benjamin Peirce
8	1854—Apr. 26-May 3	Washington	J. D. Dana
9	1855—Aug. 15-22	Providence	John Torrey
10	1856—Aug. 20-28	Albany, N. Y.	James Hall
11	1857—Aug. 12-20	Montreal	J. W. Bailey
12	1858—Apr. 28-May 4	Baltimore	A. Caswell
13	1859—Aug. 3-9	Springfield	S. Alexander
14	1860—Aug. 1-8	Newport	Isaac Lea
15	1861—Aug. 15-22	Buffalo	F. A. P. Barnard

VICE-PRESIDENT—A. Caswell (1856), J. E. Holbrook (1857), Edward Hitchcock (1858), B. A. Gould (1859), A. A. Gould (1860).

SECRETARY (PERMANENT), S. F. Baird (1851-53), Joseph Lovering (1854-66).

SECRETARY (GENERAL), W. R. Johnson (1848), E. N. Horsford (1849), L. R. Gibbes (1850), E. C. Herrick (1850), W. B. Rogers (1851), J. D. Dana (1853), J. L. Smith (1854), Wolcott Gibbs (1855), B. A. Gould (1856), John Le Conte (1857), W. M. Gillespie (1858), Wm. Chauvenet (1859), Joseph Le Conte (1860).

TREASURER, Jeffries Wyman (1848), A. L. Elwyn (1849, 1851-53, 1855-66), St. Julien Ravenel (1850), J. L. Le Conte (1854).

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v. 1, Phila., 1849; v. 2, Bost., 1850; v. 3, Charleston, S. C., 1850; v. 4-6, Washington, 1851-52; v. 7-14, Cambridge, 1855-61.

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- 1851 BACHE, A[lexander] D[allas]. Address on retiring from the duties of president . . . Wash., 1852. (In Amer. Assoc. Adv. Sc. Proc. Aug. 1851. pref. p. [41]–60).
“A few remarks in relation to the circumstances attending its organization, and to its progress, and some considerations of the direction in which we may look for its greatest usefulness.”
- 1852 ANNALS OF SCIENCE, being a record of inventions and improvements in applied science . . . conducted by H. L. Smith. Cleveland, 1852–54. 2 v.
v. 1, Sept.–Nov. 1853, contains abstracts of the 1853 meeting held at Cleveland, the regular PROCEEDINGS of which did not appear until 1856, (on pages 207–16, 219–26, 227–41, 243–54, 255–62, 263–78, 279–82).
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- 1891 GOODE, George Brown. The first national scientific Congress (Washington, April, 1844), and its connection with the organization of the American Association. Salem, Mass., July, 1892. (In Amer. Assoc. Adv. Sc. Proc. Aug., 1891. v. 40, p. 39–47).
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- BENJAMIN, Marcus. The American Association for the Advancement of Science. (In The Chautauquan. v. 13, no. 6, p. 727–31. Sept. 1891)
- 1895 PUTNAM, Frederick Ward. The history, aims and importance of the American Association for the Advancement of Science. (In Science. n. s. v. 2, p. 171–74. Aug. 16, 1895)
- 1896 HALE, William Henry. Early years of the American Association. (In Popular Sc. Monthly. v. 49, p. 501–7. Aug. 1896)
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- 1899 BENJAMIN, Marcus. . . . The early presidents of the American Association. Easton, Pa, Dec. 1899. (In Amer. Assoc. Adv. Sc. Proc. Aug. 1899. v. 48, p. 397-459, port.)

Biographical sketches with portraits of all the presiding officers from the formation of the Association through 1876.

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VANCLEVE, J. W. Fossil Zoophytes of western Ohio. p. 19-24. Rd Sept. 20.

DESOR, E[dward]. On the local distribution of marine animals. p. 30. Rd Sept. 21.

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Discussion by Peirce, Gould & Redfield, p. 28-30.

heave, and depress the superficial strata of the earth. p. 40-1. Rd Sept. 21.

BAILEY, J. W. On microscopic Foraminifera, from the soundings of the Coast Survey. p. 32. Rd Sept. 21.

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GERMAIN, L. J. On the forces in nature which rupture, contort, upheave, and depress the superficial strata of the earth. p. 40-1. Rd Sept. 22.

AGASSIZ, [Louis]. On the phonetic apparatus of cricket. p. 41. Rd Sept. 22.

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- HALDEMAN, S. S. *Phacops Hausmanii*. p. 41. Rd Sept. 22.
AGASSIZ, [Louis]. The terraces and ancient river bars, drift, boulders, and polished surfaces of Lake Superior. p. 68-70. Rd Sept. 23.
———. On the black banded Cyprynidae. p. 70. Rd Sept. 23.
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2) On a new species of Crustacea, from the shores of Massachusetts.

3) On the difference between Sirenidae and true Cetacea, and the embryonic character of the former.

4) On the homologies of Acephala and Gasteropoda with reference to the systematic position of Brachiopoda and Bryozoa.

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6) On new genera and species of Bryozoa, from the shores of Massachusetts.

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- 9) On the histology of invertebrated animals.
 - 10) On the homologies of Annulata and Caterpillars.
 - 11) On the ovarian egg and embryology of Aphides.
 - 12) On several genera of Entomostraca recently established, which have been ascertained to be embryonic states of Decapoda.
 - 13) On the embryonic character of Palaeozoic Crustacea.
 - 14) On the changes which fresh-water turtles undergo during their growth.
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POURTALES, L. F. de. On the Holothuriae of the Atlantic coast of the United States. p. 8-16. Rd May 5.

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ST. JOHN, Samuel. On a specimen of the fossil Ox (*Bos bombifrons*), found in Trumbull Co., Ohio. p. 235. Rd May 9.

Not received for printing.

OWEN, D. D., & SHUMARD, B. F. On the number and distribution of fossil species in the Palaeozoic rocks of Iowa, Wisconsin, and Minnesota. p. 235-39. Rd May 9.

See also Owen's Wisconsin, Iowa, and Minnesota Surv. (1848).

1851 **V. 6. August 19-24, at Albany, pub. 1852. 68 + 412 p.**

HORSFORD, E. N. Solidification of the rocks of the Florida reefs, and the sources of lime in the growth of corals. p. 207-15.

Also in *Amer. J. Sc.* (1818). v. 64, p. 245-53. Sept. 1852.

SHEPARD, C. U. Notice of several American minerals. p. 230-32.

———. On Chalcodite; On the Triplite (*Alluandite?*) of Norwich, Mass. p. 232-35, illus.

DANA, J. D. On the isomorphism of the chemical compounds comprised under the mineral species Tourmaline. p. 235-38.

BLAKE, W. P. Optical and blowpipe examination of the supposed chlorite of Chester Co., Pa. p. 238-41, illus.

Also in *Amer. J. Sc.* (1818), v. 62, p. 339-41, illus. Nov. 1851.

FARRINGTON, A. C. Metamorphic condition of a part of the large vein of Franklinite in New Jersey. p. 241-42.

SMITH, J. L. Notice of a magnesian opal, from near Harmanjick, Asia Minor. p. 242.

*HUNT, T. S. On the Columbite of Haddam; On the octahedral peroxide of iron. p. 242.

Not received for printing.

JOHNSON, S. W. On the Houghite of Prof. Shepard. p. 243-46, illus.

Also in *Amer. J. Sc.* (1818), v. 62, p. 361-66, illus. Nov. 1851.

BLAKE, W. P. On the occurrence of chromate of lead in Pennsylvania, and other mineralogical notices. p. 247.

———. On a new locality of red sapphire, with notices of the associate minerals. p. 247.

LECONTE, J. L. On the geographical distribution of animals in California. p. 248-54.

KIRTLAND, J. P. Peculiarities of the climate, flora, and fauna of the south shore of Lake Erie, in the vicinity of Cleveland, Ohio. p. 254.

AGASSIZ, L[ouis]. Remarks upon the unconformability of the Palaeozoic formations of the United States. p. 254-56.

HALL, James. Comparison of the geological features of Tennessee with those of the state of New York. p. 256-59.

HOUGH, F. B. On the existence of diluvial agencies during the earlier geological periods. p. 262-64.

HITCHCOCK, E[dward]. On the terraces and sea-beaches that have been formed since the Drift period, especially those along the Connecticut river. p. 264-69.

SMITH, J. L. On the geology and general character of the meerscham in the plains of Eski-Shehr (Asia Minor). p. 270.

HUNT, T. S. Remarks on the lithological and paleontological characters of the Potsdam limestone. p. 271-73.

HITCHCOCK, E[dward]. On the metamorphic coalfield of Massachusetts. p. 273.

Not received for printing.

ROGERS, W. B. On the passage of anticlinal axes into faults. p. 274.

Not received for printing.

SMITH, J. L. On the geology of emery and corundum. p. 274.

ROGERS, W. B. Notes on the geological structure of Western Vermont and Massachusetts. p. 274.

Not printed.

WELLS, D. A. On the distribution of manganese. p. 275-76.

MAURY, M. F. On the geological agency of the winds. p. 277-96.

FARRINGTON, A. C. Fault in a metallic vein as seen at Sterling mine, New Jersey. p. 296.

OSBORNE, A. On the boulder hypothesis. p. 297.

Not printed.

FARRINGTON, A. C. On a distorted quartz vein in Sienite. p. 297.

Not received for printing.

ROGERS, H. D. On the methods of investigation adopted in the Geological survey of Pennsylvania. p. 297.

Not received for printing.

WELLS, D. A. On the origin of stratification. p. 297-99.

Also rd before Bost. Soc. Nat. Hist. (1830), Oct. 1, 1851. Also in *Amer. J. Sc.* (1818), v. 63, p. 11-4, 1852.

HITCHCOCK, Edward. On the geological age of the clay slate of the Connecticut valley, in Massachusetts and Vermont. p. 299-300.

ROGERS, W. B. On the geological age of the coalbearing rocks of North Carolina. p. 300.

Not printed.

HALL, James. Remarks on the Trilobite of the Potsdam sandstone, named by Dr. Owen *Dikellacephalus*, and its relations to *Asaphus* and *Ogygia*. p. 301.

Not received for printing.

FOSTER, J. W. On the alternations of marine and terrestrial organic remains in the Carboniferous series of Ohio. p. 301-4.

HALL, James. Remarks upon the fossils of the Potsdam sandstone. p. 304.

Not received for printing.

ROGERS, H. D. On the vegetation of the infra-carboniferous rocks of Pennsylvania, and a description of a new genus of fossil plants. p. 304.

Not received for printing.

BRAINERD, J[ehu]. On some fossils of northern Ohio. p. 304-6, illus.

HALL, James. Remarks upon the fossil corals of the genus *Favosites*, and allied fossil genera *Favistella*, *Astiocerium*, and others. p. 306.

Not received for printing.

ROGERS, H. D. On some reptilian footmarks of the Infra-Carboniferous red shale of Pennsylvania. p. 306.

Not received for printing.

HALL, James. 1) On the Palaeozoic genera *Trematopora*, *Cellepora*, etc. 2) Tracks, trails, etc., in the shales and sandstones of the Clinton group from Green Bay; with remarks on the thinning out and reappearing of this portion of the Clinton group. p. 306.

Not received for printing.

TORREY, John. 1) On two new species of *Juglans*; 2) On the *Chenopodiaceae* of North America. p. 307.

Not received for printing.

BURNETT, W. I. Points in the economy of the seventeen year locust (*Cicada septemdecim*), bearing upon the plural origin and special local creation of the species. p. 307-12.

MAURY, M. F. On the habits of the whale. p. 312.

Not received for printing.

AGASSIZ, L[ouis]. 1) On a new type of generation observed among *Medusae*; 2) Monograph of the genera *Dysnomia* (Ag.), *Complanaria* (Sw.), *Lampsilis* (Raf.); with general remarks on the other genera of *Naiades*. p. 312.

Not received for printing.

BURNETT, W. I. Relations of embryology and spermatology to animal classification. p. 312-18.

GIRARD, Charles. On the classification of *Mammalia*. p. 319-35, 2 pl.

SALISBURY, J. H. Influence of the poison of the northern rattlesnake (*Crotalus durissus*) on plants. p. 336-37.

LE CONTE, John. Observations on the freezing of vegetables, and on the causes which enable some plants to endure the action of extreme cold. p. 338-59.

Also in *Amer. J. Sc.* (1818), v. 63, p. 84-92, 195-206. 1852.

HUNT, E. B. Views on the nature of organic structure. p. 359-64.

Also in *Amer. J. Sc.* (1818), v. 63, p. 53-8. Jan. 1852.

BURNETT, W. I. Relations of embryology and spermatology to some of the fundamental doctrines of physiological science. p. 368-74.

Also in *Amer. J. Sc.* (1818), v. 63, p. 281-85. Mar. 1852.

SQUIER, E. G. On the aborigines of Nicaragua. p. 378.

Not received for printing.

LE CONTE, J. L. On the distinctive characteristics of the Indians of California. p. 378-82.

1852 No Meeting owing to Cholera Outbreak in Cleveland.
Postponed until 1853—see next entry.

1853 v. 7, July 28-Aug. 2, at Cleveland, pub. 1856. 20 + [292] p.

Abstracts of the Proceedings of this Meeting were published in the *ANNALS OF SCIENCE* (1852), for 1853. Abstracts for individual papers are noted below in the appropriate places. The *PROCEEDINGS* in its official form did not appear until 1856.

THOMAS, W. H. B. Indications of weather, as shown by animals and plants. p. 119-22.

Abstr. *Ann. Sc.* v. 1, p. 237-39. Sept. 1853.

HORSFORD, E. N. On the solidification of the coral reefs of Florida, and the source of carbonate of lime in the growth of corals. p. 122-47.

Abstr. *Ann. Sc.* v. 1, p. 239. Sept. 1853.

WINCHELL, Alexander. On the geology of the Choctaw Bluff, Greene Co., Ala. p. 150-53, illus.

SAFFORD, J. M. On the parallelism of the lower Silurian groups of Middle Tennessee with those of New York. p. 153-56.

Abstr. *Ann. Sc.* v. 1, p. 249-51. Oct. 1853.

NEWBERRY, J. S. On the structure and affinities of certain fossil plants of the Carboniferous era. p. 157-62, illus.

Abstr. *Ann. Sc.* v. 1 p. 268-70, illus. Oct. 1853.

———. On the Carboniferous flora of Ohio, with descriptions of fifty new species of fossil plants. p. 163-66.

Abstr. *Ann. Sc.* v. 1, p. 280-81. Oct. 1853.

———. On the fossil fishes of the cliff limestone of Ohio. p. 166-67.

Abstr. *Ann. Sc.* v. 1, p. 282-83. Nov. 1853.

WOOD, Alphonso. An account of six new species of plants. p. 175-79.

HOWELL, R. On the wheat-fly and its ravages. p. 179-81.

POURTALES, L. F. de. Notes on the specimens of the bottom of the ocean brought up in recent explorations of the Gulf Stream, in connection with the Coast Survey. p. 181-84.

Abstr. Ann. Sc. v. 1, p. 243. Oct. 1853.

BURNETT, W. I. On the formation and mode of development of the renal organs of the Vertebrata. p. 184-99.

Abstr. Ann. Sc. v. 1, p. 248-49. Oct. 1853.

———. On the formation and function of the Allantois. p. 200-3.

Abstr. Ann. Sc. v. 1, p. 249. Oct. 1853.

———. Researches on the development of the viviparous Aphides. p. 203-23.

Abstr. Ann. Sc. v. 1, p. 252-54. Oct. 1853.

———. On the reproduction of the toad and frog, without the intermediate stage of tadpole. p. 230-32.

Abstr. Ann. Sc. v. 1, p. 279-80. Nov. 1853.

———. On the blood corpuscle-holding cells and their relation to the spleen. p. 224-30.

———. On the signification of cell segmentation. p. 232-34.

Abstr. Ann. Sc. v. 1, p. 281-82. Nov. 1853.

SANFORD, S. N. On some points in the history of Gordius. p. 250.

Abstr. Ann. Sc. v. 1, p. 270. Nov. 1853.

RIDDELL, J. L. On the structure and transformation of *Oscillaria aureliana*. p. 272.

Not received for printing.

Abstr. Ann. Sc. v. 1, p. 267. Nov. 1853.

BAIRD, S. F. Account of the recent American scientific exhibition. p. 272.

Not received for printing.

BRAINERD, J[ehu]. Origin of quartz pebbles in the sandstone conglomerate, and the formation of the siliceous stratified rocks.

In *Annals Sc.* v. 1, p. 235-36. Sept. 1853.

Discussion by Messrs. Newberry & Hall.

REDFIELD, W. C. On the geological age and affinities of the fossil fishes which belong to the sandstone formation of Connecticut, New Jersey, and the coal field near Richmond, Virginia. p. 272.

Not received for printing.

Abstr. Ann. Sc. v. 1, p. 270-71. Nov. 1853.

WARDER, J. A. A geological reconnaissance of the Arkansas River.

Not received for printing.

Abstr. Ann. Sc. v. 1, p. 234-35. Sept. 1853.

1854 v. 8, April 26-May 3, at Washington, pub. 1855. 56 + 316 p.

MAURY, M. F. On the whale. p. 271.

Not received for printing.

DARBY, J. On the development of monocotyledonous stems. p. 271.

Not received for printing.

PARRY, C. C. Sketch of the general zoological structure of the region of country in connection with the United States and Mexican Boundary line. p. 271.

Not received for printing.

See U. S. & Mexican Boundary Surv. (1848).

GIBARD, Charles. Life in its physical aspects. p. 271.

Not received for printing.

SCHOTT, Arthur. The Cretaceous basin of the Rio Bravo del Norte. p. 272-83.

JOHNSTON, John. Notice of some spontaneous movements occasionally observed in the sandstone strata in one of the quarries at Portland, Connecticut. p. 283-86.

HOPKINS, William. Brief outline or general description of a remarkable fossil not known to be described and by some supposed to be an Ichthyodorulite. p. 287-90, illus.

HALL, James.

(1) Observations upon geology of the Mauvaises Terres, Nebraska, with notices of the geographical and geological range of some of the fossils of that region.

(2) Remarks upon a collection of Cretaceous fossils from Nebraska, and the absence of species known in the southern extension of the same formation.

(3) Remarks upon the results of extensive and continued collections of fossil species from a portion of the Silurian rocks of New York.

(4) On the reproduction of similar types or representative species in successive geological formations illustrated by a collection of species of the Brachiopoda from the Niagara and lower Helderberg groups of the Palaeozoic rocks of the United States.

(5) Red sandstone of the Connecticut river valley, and the proofs of its Oolitic or Liassic age. p. 290.

Not received for printing.

DANIELS, Edward. Geology of the lead mines of Wisconsin. p. 290.

Not received for printing.

ROGERS, W. B. On the age of the so-called new red sandstone of the United States. p. 290.

Not received for printing.

SILLIMAN, Benjamin, Jr. Notice of a peculiar variety of coal from Breckenridge Co., Kentucky. p. 291.

HALL, James.

1) Remarks upon the geological formation of the country along the line of the Boundary survey, based upon the examination of Dr. Parry, made under the order of Major Emory.

2) The Silurian and Devonian systems, and the nature of the evidence for drawing a line of separation between the two systems in the United States.

3) On the western limits of the Cretaceous formation on the northern continent of America, as evidenced by the various collections

that have been made by Exploring expeditions under the United States government. p. 291.

Not received for printing.

*HUNT, T. S. On the crystalline limestone of North America. p. 291.
Printed in *Amer. J. Sc.* (1818), v. 68, p. 193-200. Sept. 1854.

1) On phosphatic organic remains in the Palaeozoic rocks.
2) On the chemical composition and metamorphoses of some sedimentary rocks.

3) On a number of mineral species. p. 291.

Not received for printing.

ROGERS, H. D. 1) Some comparative observations on Carboniferous strata of North America. 2) On some phenomena of cleavage structure, and metamorphism in coal and other strata. p. 291.

Not received for printing.

ROGERS, W. B. On the cleavage and other effects caused by trap dikes in the Middle Secondary rock of Virginia. p. 291.

Not received for printing.

1855 v. 9, August 15-22, at Providence, pub. 1856. 46 + 311 p.

DANA, J. D. Progress of geology (the President's "Address"). p. 1-36.

Also in *Amer. J. Sc.* (1818), v. 72, p. 305-34. Nov. 1856.

Repr. in *Canadian Nat. & Geol.* v. 1, p. 395-430. 1857.

SMITH, Sanderson. On some new localities of minerals. p. 188-89.

SMITH, J. L. Re-examination of American minerals. Pt. 5: the minerals of the Wheatley mine in Pennsylvania. p. 190-204, illus.

Also in *Amer. J. Sc.* (1818), v. 70, p. 242-53, illus. Sept. 1855.

WHITNEY, J. D. Remarks on some points connected with the geology of the north shore of Lake Superior. p. 204-9.

Abstract.

On the occurrence of the ores of iron in the Azoic system. p. 209-16.

Also in *Amer. J. Sc.* (1818), v. 72, p. 38-44. July, 1856.

Also in *Mining Mag.* (1853), v. 7, p. 67-73. July, 1856.

BLAKE, W. P. On the grooving and polishing of hard rocks and minerals by dry sand. p. 216-20.

See also *Pacific R.R. Surv.* (1853), Williamson's Exped. v. 5.

Observations on the characters and probable geological age of the sandstone formation of San Francisco. p. 220-22.

Abstract.

Remarks upon the geology of California, from observations in connection with the United States surveys and explorations for a railroad route to the Pacific. p. 222-25.

See also *U. S. Pacific R.R. Surv.* (1853).

Williamson's Exped. —, v. 5.

HITCHCOCK, Edward. Description of several sections measured across the sandstone and trap of Connecticut River valley in Massachusetts. p. 225-27.

———. Additional facts respecting the tracks of the *Otozoum Moodii* on the Liassic sandstone of the Connecticut valley. p. 228.

———. 1) Traces of ancient glaciers in New England. 2) Inferences from facts respecting the erosions of the earth's surface, especially at rivers. p. 228.

Not received for printing.

HITCHCOCK, Edward. Account of the discovery of the fossil jaw of an extinct family of sharks, from the coal formation. p. 229-30, illus.

BLAKE, W. P. Note upon a peculiarity of the "Redwood" (genus *Sequoia*). p. 230.

———. Notes upon the grove of "Mammoth trees" in Calaveras Co., California. p. 231-32.

GRAY, A. B. . . . On the *Ammobroma Sonorae*. p. 233-36.

Note by Torrey, p. 236.

BROOKS, Charles. Laws of reproduction, considered with particular reference to the inter-marriage of first-cousins. p. 236-46.

KNEELAND, Samuel, Jr. On the sterility of many of the varieties of the domestic fowl, and of hybrid races generally. p. 246-50.

BLAKE, W. P. 1) Notice of remarkable specimens of crystallized and arborescent gold, from California. 2) On the deposits of fossil microscopic organisms at Monterey, California, with specimens. 3) Notes upon the geology and mineral association of the cinnabar sulphuret of mercury, of New Almaden, Cal., with specimens. p. 276. (No. 11-13).

Not received for printing.

ROGERS, W. B. On the stratigraphical position of the coal-bearing rocks below the upper red shale and Carboniferous limestone of the Middle and Southern states. p. 276. (No. 14).

Not received for printing.

GUYOT, A[rnold]. On the configuration of the soil of New England. p. 277. (No. 15).

Not received for printing.

DANIELS, Edward. 1) On the occurrence of Proboscidon remains in Wisconsin; 2) On the character of the lead deposits of the upper Mississippi; 3) On the occurrence of silicious grits as veinstones in the lead mines of Wisconsin. 4) Some observations on the northern outcrop of the Illinois coal formation. p. 277. (No. 16-19).

Not received for printing.

HALL, James. 1) Contributions to our knowledge of the geology of Nebraska and the Mauvais Terres. 2) Notes upon the genus *Graptolithes*; 3) On the development of the septa in the genus *Baculites*, from the extreme young to the adult state. p. 277. (No. 20-22).

Not received for printing.

ROGERS, W. B. On some effects produced by the trap on the adjoining Liassic rocks of Virginia. p. 277. (No. 23).

Not received for printing.

BURGESS, Ebenezer. 1) Notes on the geology of western India; 2) Remarks on the geological formation of Table Mountain, Cape of Good Hope. p. 277. (No. 24-25).

Not received for printing.

AGASSIZ, L[ouis]. 1) On the metamorphic rocks of Nahant, Mass., 2) On gradation among Polypteri; 3) On the system of zoology. p. 277. (No. 26-28).

Not received for printing.

TORREY, John. On the Big-Root of California, a new genus of Cucurbitaceae (Megarrhiza). p. 278. (No. 32).

Not received for printing.

GRAY, Asa. 1) Notes on the nature of the coverings of the seeds of magnolia, and on the dioecious character of species of Plantago; 2) Motions effected by plants result from the contractions of cells. p. 278. (No. 29-30).

Not received for printing.

1856 v. 10, (pt. 2), Aug. 20-28, at Albany, pub. 1857. 48 + 240 + [259] p.

DANA, J. D. Plan of development in the geological history of North America. p. 1-18, map.

*DAWSON, J. W. On the parallelism of the rock formations of Nova Scotia with those of other parts of America. p. 18-25.

SCHOTT, Arthur. Geological observations on the Pluto-volcanic slope of the Sierra Madre along the azimuth boundary line through Northwest Sonora, made under the direction and communicated with the permission of the United States Commissioner, Major W. H. Emory. p. 25-50.

See also U. S. & Mexican Boundary Surv. (1848).

HALL, James. On the Carboniferous limestones of the Mississippi Valley. p. 51-69, illus.

Also in Amer. J. Sc. (1818), ser. 2, v. 23, p. 187-203, illus. Mar. 1857. Also in Mining Mag. (1853), v. 9, p. 529-42. Dec. 1857.

See also IOWA GEOL. SURV. (1855).

GIBBES, L. R. Remarks on Niagara Falls. p. 69-78, illus.

LESLEY, J. P. On the Broad Top coal basin in Central Pennsylvania. p. 78-81, map.

WINCHELL, Alexander. Notes on the geology of middle and southern Alabama. p. 82-94, illus.

———. Statistics of some artesian wells of Alabama. p. 94-103.

LE CONTE, Joseph. On the agency of the Gulf Stream in the formation of the peninsula of Florida. p. 103-19, illus.

Also in Amer. J. Sc. (1818), ser. 2, v. 23, p. 46-60, illus. Jan. 1857.

BLAKE, W. P. Observations on the orography of the western portion of the United States. p. 119-34.

See also Pacific RR. Surv. (1853), Williamson's Exped., v. 5.

EMORY, W. H. General description of the country adjacent to the boundary between the United States and Mexico. p. 134-48.

See also U. S. & Mexican Boundary Surv. (1848).

FOSTER, J. W. On the geological position of the deposits in which occur the remains of the fossil elephant of North America. p. 148-69, illus.

WYMAN, J[effries]. Note on the teeth of an elephant discovered near Zanesville, Ohio. p. 169-72.

———. On a Batrachian reptile from the coal formation. p. 172-73.

Also in *Amer. J. Sc.* (1818), v. 75, p. 158-64, illus. Mar. 1858.

*DAWSON, J. W. Remarks on a specimen of fossil wood from the Devonian rocks, (Gaspé Sandstones) of Gaspé, Canada East. p. 174-76, illus.

HALL, James. Observations on the genus *Archimedes*, or *Fenestella*, with descriptions of species, etc. p. 176-80.

Also in *Amer. J. Sc.* (1818), v. 73, p. 203-4. March, 1857.

REDFIELD, W. C. On the relations of the fossil fishes of the sandstone of Connecticut, and other Atlantic states, to the Liassic and Jurassic periods. p. 180-88.

Also in *Amer. J. Sc.* (1818), v. 72, p. 357-63. Nov. 1856.

WORTHEN, A. H. On the occurrence of fish remains in the Carboniferous limestone of Illinois. p. 189-92.

WEINLAND, D. F. On the names of animals and plants, with reference to the origin of languages, and to the countries where nations passed their childhood. p. 193-97.

———. On the digestive apparatus of the *Acanthocephala*. p. 197-201.

HALL, James. On some points in the geology of the upper Mississippi valley. p. 226. (No. 48).

NEWBERRY, J. S. (1) Generalities of the geology of Oregon and northern California.

(2) The Metamorphic action of siliceous thermal springs. p. 226. (No. 50-51).

Not received for printing.

TUOMEY, M[ichael]. Sketch of the progress of geology in Alabama. p. 226. (No. 52).

Not received for printing.

EMMONS, Ebenezer. The Permian and Triassic systems of North Carolina. p. 226. (No. 53).

Not received for printing.

STEVENS, R. P. Some observations on the coal fields of Illinois. p. 226. (No. 54).

Not received for printing.

WHITNEY, J. D. Notice of a remarkable instance of inclined stratification in Warren Co. N. Y. p. 227. (No. 55).

Not received for printing.

HITCHCOCK, Edward. Lateral disturbance in the surface strata in the sandstone quarries of Newark, N. J. p. 227. (No. 56).

Not received for printing.

*HUNT, T. S. 1) On some Euphotides and other felspathic rocks; 2) On the Serpentine of the Green Mountains, and some of their associates. p. 227. (No. 57-58).

Not received for printing.

BLAKE, W. P. Observations on the geology of the regions between the Mississippi and the Pacific Ocean. p. 227. (No. 59).

Not received for printing.

HALL, James. On the results of collections of fossils during a period of ten years in the limestones of the lower Helderberg. p. 227. (No. 60).

Not received for printing.

ROGERS, W. B. Proofs of the Protozoic age of some of the altered rocks of eastern Massachusetts, from fossils recently discovered. p. 227. (No. 61).

Not received for printing.

NEWBERRY, J. S. 1) The deposits of fossil fishes and reptiles of Linton, Ohio; 2) The Tertiary flora of the upper Missouri. p. 227. (No. 62-63).

Not received for printing.

FOSTER, J. W. & WYMAN, Jeffries. On the geological position of the remains of the extinct Peccary of the northwest, by J. W. Foster; together with some observations on their dentology by Jeffries Wyman. p. 227. (No. 64-65).

Not received for printing.

HITCHCOCK, E[dward] Jr. Description of a fossil shell found in the sandstone of the Connecticut valley, probably belonging to the genus Spherulites. p. 227. (No. 66).

Not received for printing.

HAMLIN, A. C. Exhibition of fossil Cetacea from Maine. p. 227. (No. 67).

Not received for printing.

WILSON, Daniel. The value of physical conformation as an element of ethnological science. p. 228. (No. 75).

Not received for printing.

WEINLAND, D. F. On the organization of the Acanthocephala. p. 228. (No. 72).

Not received for printing.

AGASSIZ, L[ouis]. 1) Animal development; Pt. 1, The egg; pt. 2, the embryo; pt. 3, one-celled animals; 2) On viviparity and oviparity; 3) On the classification of turtles. p. 228. (no. 69-71.)

HITCHCOCK, Edward. Mud-nests of the tad-pole, recent and fossil. p. 228.

Not received for printing.

1857 v. 11, (pt. 2), August 12-20, at Montreal, pub. 1858. 56 + 204 + 187 p.

Abstracts of the Papers read at this Meeting are in the CANADIAN GEOL. & NAT. v. 2, p. 241-99. Sept. 1857.

SWALLOW, G. C. Explanations of the geological map of Missouri, and a section of its rocks. p. 1-21, pl.

See also Missouri Geol. Surv. (1853.)

———. Quaternary deposits of Missouri. p. 21-39 pl.

See also Missouri Geol. Surv. (1853.)

LESLEY, J. P. On three comparative sections of the coal-measures in Kentucky, and in eastern and western Pennsylvania. p. 39-42.

WHITTLESEY, Charles. On the ancient mining operations of Lake Superior. p. 42-4.

*LOGAN, W. E. On the division of the Azoic rocks of Canada into Huronian and Laurentian. p. 44-7.

———. On the probable sub-division of the Laurentian series of rocks of Canada. p. 47-51.

HITCHCOCK, C. H. On the fractured ledges of slate in Vermont. p. 51-5, illus.

EMORY, W. H. On a feature in the range of the western mountain system of North America. p. 56-7.

See also U. S. & Mexican Boundary Surv. (1848.)

*DAWSON, J. W. On the varieties and mode of preservation of the fossils known as Sternbergia. p. 67-74, illus.

———. On the newer Pliocene fossils of the St. Lawrence Valley. p. 74-5.

EMMONS, E[benezer]. Fossils of the sandstones and slates of North Carolina. p. 76-80.

HILGARD, T. C. On the structure of the head in Vertebrata and its relation to the phylloctactic laws. p. 81-96.

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SWALLOW, G. C. Rocks of Kansas. p. 214-21.

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BREVOORT, J. C. Remains of the American Mastodon found on Long Island, near New York. p. 232-34.

WEINLAND, D. F. Notice of two human Cestoidea, new to science. p. 254-56.

———. [Some principles of] animal psychology. p. 256-66.

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WARNER, H. G. Marine phosphorescence. p. 286. (no. 33)

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HUNT, E. B. Observations on the geological structure of Key West, and on a species of fictitious fossils abounding there. . . . p. 286. (no. 35)

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*LOGAN, W. E. Contribution to the history of the Laurentian limestones. p. 310-12.

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HITCHCOCK, C. H. On the so-called talcose schist of Vermont. p. 321-29.

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———. Lake ramparts in Vermont. p. 335-37.

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FOSTER, J. W. On the geological position of the bones of the extinct Peccary of the West. p. 35. (no. 33)

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BLAKE, W. P. 1) On a remarkable vein of gold in the bed of the
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———. Synchronism of coal-beds in the New England and western
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. . . 2) On the recent discovery by Norman Eastop, of fossils in the
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BLAKE, W. P. Remarks on the distribution of gold in veins, with notes upon remarkable gold specimens from Georgia. p. 228. (no. 35)

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WHITNEY, J. D. 1) Some points in the surface geology of the North-west; 2) On the origin of the prairies of the North-west. p. 228. (no. 34, 43)

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WEBSTER, N. B. On certain phenomena of the great Dismal Swamp in Virginia and North Carolina. p. 228. (no. 38)

ESSEX INSTITUTE, SALEM, MASS., (1848)

History

“The ESSEX INSTITUTE was formed in 1848 by the union of the Essex Historical and the ESSEX COUNTY NATURAL HISTORY SOCIETY (1833), q.v. During the autumn of 1847, the Historical and Natural History Societies held several meetings to effect a union. A joint committee was appointed to draft a plan to serve as a basis of organization. The plan offered by the Committee was accepted by the Societies at a meeting held on January 14th, 1848. The Act of Incorporation from the Legislature was obtained in February of the same year, and on the first of March following, by its acceptance, the ESSEX INSTITUTE was organized.

"A committee to prepare a Constitution and by-laws was appointed and their report was accepted at a meeting held on the eighth of March. Thus organized, the Institute consists of three departments: the Historical, having for its object, the collection and preservation of whatever relates to the geography, antiquities, civil and ecclesiastical history of Essex County, in Massachusetts; the NATURAL HISTORY, for the formation of a Cabinet of natural productions in general, and more particularly of those of the County, and for a library of standard works on the natural sciences; the Horticultural, for promoting a taste for the cultivation of choice fruits and flowers, and also for collecting works on horticulture and agriculture in connection with the general library.

"The library contains about 22,000 volumes; the Museum: the several departments of the Institute are well represented and in a number of the classes of the animal kingdom, the collections are inferior to but one or two others in the country; though the crowded state of the rooms devoted to the Museum will not allow of their being so advantageously arranged as is desirable. . . . In consequence of this liberal use of its rich supply of duplicates, the Institute has been the recipient of large and valuable collections from Scientific Institutions and men, both in this country and abroad, and the specimens are arriving in such numbers as to tax its resources to their utmost in order that the proper care may be taken of these treasures. . . .

"The section of ethnology contains about 1400 specimens; there are about 220 geological specimens; 2200 mineral specimens from Essex County; 2926 specimens of fossils; 6500 species of plants; 100 specimens of sponges; 1500 of Radiates; 9000 of Mollusks; 28,015 of Articulates; 4610 of Vertebrates; and 656 specimens in the osteological collection.

"The meetings are held as follows: stated quarterly meetings; regular meetings on the 1st and 3rd Mondays of the month, and Field meetings during the summer months at such times and places as may be agreed upon. The first field meeting took place at Danvers on Tuesday, June 12, 1849. . . . These meetings were continued for two or three years, when they were discontinued in consequence of the removal by death of several of those members who were the most interested, among whom may be mentioned, Thomas Cole, Andrew Nichols. . . . In consequence of the accession of several young and enthusiastic members, these meetings were again renewed in the summer of 1856, and have been continued since that time with great success and an increasing interest.

“ ‘At these meetings we bring together those who feel an interest in the works of Nature, and who make them their especial study; and we place them face to face with the various phenomena of creation, as they are exhibited in our fields, our hills and our forests. By these excursions, we are relieved from the necessity of studying these things in the dry, dead cabinets of home, and the student who walks with us has a view of them as Nature has herself arranged them, drawing his conclusions from facts undisguised by the interference of man, and free from that partial and imperfect character which will ever be detected, even in the best ordered and fullest collection.’ ” G. D. Phippen. *Essex Inst. Proc.* v. 3, p. 101, August 6, 1861.

“Lectures: Two courses of miscellaneous lectures have been given by the Society; One of six lectures, during the Spring of 1863, by Professors Agassiz, S. Tenney, J. P. Cooke, W. B. Rogers, and Messrs. C. M. Tracy, and F. W. Putnam; the other, a course of ten lectures, during the winter of 1863 and 1864, by Dr. C. T. Jackson, B. Peirce, President Hill, of Harvard University, and Messrs C. W. Tuttle, Cleveland Abbe, N. E. Atwood, Alpheus Hyatt, C. M. Tracy and A. E. Verrill.

“Rev. J. L. Russell, in May, 1852, delivered a course of ten lectures on the Development of the Plant, to a private class in the rooms of the Institute; also a similar course in the months of January and February, 1859. During the winter of 1853 and 1854 several meetings were devoted by Mr. Russell to lectures on Insects. F. W. Putnam in the months of April and May, 1861, delivered a course of lectures on Zoology in the Hall of the Institute; also a course of five lectures on Insects, on the five Thursday evenings of March, 1865 at the Lyceum Hall, under the auspices of the Institute. C. M. Tracy gave a course of eight lectures on Botany, at the Institute rooms, commencing on Saturday afternoon, April 29, 1865, and continued on successive Saturdays.” From the HISTORICAL NOTICE. 1865. P. 11-7 (see Bibliography below).

Officers

PRESIDENTS: 1848-61, Daniel A. White; 1861-65, Asahel Huntington; 1865, Francis Peabody.

VICE-PRESIDENTS: 1848-57, John Glen King; 1848-61, John Lewis Russell; 1848-1860, John Clarke Lee; 1858-1862, Henry Mason Brooks; 1860-1864, James Upton; 1861, Samuel P. Fowler; 1862, Abner C. Goodell, Jr.; 1864, John Fiske Allen.

CABINET-KEEPERS: 1848-49, Frederic Howes, Jr.; 1850-56, George A. Perkins; 1856-57, Frederick A. Putnam; 1857-1860, Caleb Cooke; 1860-64, Richard Wheatland.

TREASURER: Henry Wheatland, 1848.

SUPERINTENDENT OF MUSEUM: Frederic W. Putnam.

CURATORS OF NATURAL HISTORY DEPARTMENT:

1848-56 William Mack
 1848 Henry F. King
 1848-56 Samuel P. Fowler
 1856-61 John Lewis Russell
 1856-62 Frederic Winsor
 1856 Frederic W. Putnam
 1856-59 Charles R. Waters
 1856-57 Charles J. Lee
 1856-63 Richard H. Wheatland
 1856 Henry Wheatland
 1856 Caleb Cooke
 1856-61 George A. Perkins
 1856-60 Benjamin F. Mudge
 1856 Henry F. Shephard
 1857-59 Pickering D. Allen
 1860-63 David M. Balch
 1861 Cyrus M. Tracy
 1863-64 Thomas M. Pond
 1863 James H. Emerton
 1863 Charles H. Higbee

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- 1848 ESSEX INSTITUTE. Proceedings . . . 1848-1867. Salem, Mass., Essex Institute, [1848]-70. 6 v.

For dates of publications of the various volumes see below PROCEEDINGS: Dates of Publication. With v. 4, COMMUNICATIONS to the Essex Institute were issued separately, at the same time with corresponding numbers of the PROCEEDINGS. Ceased publication, with v. 6, and a new series, the BULLETIN, was begun in 1869 see below).

- 1855 ———. Act of incorporation, constitution and by-laws of the Essex Institute, incorporated February, 1848, with a catalogue of the officers and members. Salem, Mass., Printed by Ives & Pease. Dec., 1855. 24 p.

Remarks explanatory of the objects of the Institute, p. 3-8; and of the Natural History Department, p. 4-5.

- 1865 ———. An historical notice of the Essex Institute; Act of incorporation, constitution and by-laws, and a list of the officers and members. Salem, Mass., Printed by the Institute, Dec. 1865. 44 p.

History of the ESSEX COUNTY NAT. HIST. SOC. (1833). q.v., p. 8-11.

- 1869 ————. Bulletin of the . . . for 1869-1898. Salem, Mass., Essex Inst., 1869-98. 30 v.
Ceased publication with v. 30.
- 1873 ————. Twenty-fifth anniversary—Wednesday, March 5, 1873. (In Essex Inst. Bull. v. 5, p. 42-76. 1873)
- 1880 ROBINSON, John. Notes on the flora of Essex County, Massachusetts, with sketches of the early botanists, and a list of the publications on these subjects. Salem, Mass., July-Sept. 1880. (In Essex Inst. Bull. v. 12, no. 7-9, p. 81-97)
Bibliography, p. 95-6.
- 1884 MC DANIEL, B. F. Geology and mineralogy in Essex County, Massachusetts. Salem, Mass., July-Dec. 1884. (In Essex Inst. Bull. v. 16, p. 133-40.)
An historical account.
- 1884 FOWLER, Samuel P[age]. A historical sketch: the Essex County Natural History Society and the Essex Institute. Salem, Mass., July-Dec. 1884. (In Essex Inst. Bull. v. 16, no. 7-12. p. 141-45)
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ROBINSON, John. The progress of botany in Essex County during the last half-century, especially as influenced by the Essex County Natural History Society and the Essex Institute: 1834-1884. Salem, Mass., July-Dec. 1884. (In Essex Inst. Bull. v. 16, no. 7-12, p. 122-32)
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- 1898 ESSEX INSTITUTE. The first half-century of the Essex Institute, commemorated at Salem, March first and second, 1898. Salem, Jan.-June, 1898. 3 + p. 1-100, illus. pl. (In its Bull. v. 30, no. 1-6)
Repr. as a separate, Salem, 1898. 100 p.

Proceedings (P), and Communications (Com.)

Dates of Publication

With v. 4, COMMUNICATIONS to the Institute were issued with the PROCEEDINGS, separately paged.

v. 1, for 1848, June	-1856, May 12, pub.	1856.	276 p.
2,	1856, May 14-1860, Apr. 26,	1862.	438 p. 1 pl.
3,	1860, May 7-1863,	1864.	302 p.
4,	1864	-1865,	1864-66. 195 + 6 + 244
			p. 14 pl.

5,	1866	-1867,	1867-68.	7 + 215 + 4 + 339 p. 4 pl.
6,	1867	-1870,	1868-70.	7 + 79 + 178 p. 2 pl

Papers on Natural History

- 1849 ANON. Field meeting at Danvers and Wenham. P. v. 1, p. 12. June 12.
ANON. Field meeting in the vicinity of Lynnfield. P. v. 1, p. 12-3. July 24.
ANON. Field meeting in Essex Woods, Manchester and vicinity. P. v. 1, p. 13. Aug. 28.
- 1850 COLE, Thomas. A list of infusorial objects found chiefly in the neighborhood of Salem, Mass., with a sketch of the progress in this branch of natural history. P. v. 1, p. 33-48. Rd May 8.
ANON. Field meeting at Hamilton, Essex County. P. v. 1, p. 13-4. June 19.
ANON. Field meeting at North-Andover, Sutton's Mills. P. 1. 1, p. 14-5. Aug. 16.
- 1851 RUSSELL, J. L. . . . Remarks on the flora of the vicinity of Brattleborough, Vt., especially of the cryptogamic plants found by him on Mine Mountain. P. v. 1, p. 15-6. Rd Dec. 11.
- 1852 WHEATLAND, Henry. . . . Observations on the history of Goliath beetles . . . P. v. 1, p. 17. Rd Jan. 8.
———. On the Physalia Atlantica. P. v. 1, p. 19. Rd Mar. 18.
PERKINS, G. A. On several species of ants from tropical Africa. P. v. 1, p. 20-1. Rd April 21.
- 1853 RUSSELL, J. L. The Protococcus nivalis or red snow of the Arctic regions. P. v. 1, p. 24. Rd Jan. 6.
FOWLER, S. P. Our birds, their past and present history. P. v. 1, p. 24. Rd Jan. 6.
———. The present history of the birds of New England. P. v. 1, p. 25. Rd Mar. 10.
TUTTS, Samuel, Jr. A list of shells, collected at Swampscot, Lynn and vicinity. P. v. 1, p. 25-32. Rd Mar. 10.
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- 1854 WHEATLAND, Henry. . . . On the skull of the walrus . . . in the cabinet of the society . . . P. v. 1, p. 62-4. Rd Feb. 2.

- PERKINS, G. A. . . . On the geography, natural history, etc., of the western coast of Africa (especially of Cape Palmas). P. v. 1, p. 66-8. Rd Mar. 16.
- PHIPPEN, G. D. On the advantages and uses of natural history. P. v. 1, p. 72-3. Rd April 19.
- RUSSELL, J. L. On the Victoria regia or the great water lily of America. P. v. 1, p. 81-8. Rd Dec. 21.
- 1855 ———. On the Myriangium Curtsii, at Hingham . . . P. v. 1, p. 146. Rd. Nov. 23.
- PUTNAM, F. W. Fishes of Essex County. P. v. 1, p. 144-46, 148, 201. Rd Nov. 23 & Dec. 14, 1855 & Feb. 25, 1856.
- 1856 CHUTE, A. P., and STREETER, G. L. On some newly discovered minerals. P. v. 1, p. 151-54. Rd Jan. 14.
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- RUSSELL, J. L. Contributions to the cryptogamic flora of Essex County. P. v. 1, p. 191-94. Rd Feb. 11.
- . Account of some new hybrid varieties of grapes, originating in Salem, Mass., through experiments of John Fisk Allen. P. v. 1, p. 195-99. Rd Feb. 11.
- PUTNAM, F. W. Catalogue of the birds of Essex County. P. v. 1, p. 201-31. Rd Feb. 25.
- WHEATLAND, Henry. On the anatomical structure of the rabbit, together with an account of some of its habits, artificial rearing and breeding . . . P. v. 1, p. 240-41. Rd Mar. 24.
- RUSSELL, J. L. Contributions to the horticultural department: Notice of three varieties of native wild columbine, (*Aquilegia Canadensis*, L.) P. v. 1, p. 268-70. Com. May 12.
- OAKES, William. Collectanea botanica; or, Notices of rarer plants found in Essex County, Mass., from the MSS notes of the late William Oakes. P. v. 1, p. 270-73. Com. May 12.
- RUSSELL, J. L. On the importance of the herbarium. P. v. 2, p. 14-20. Rd May 14.
- WEINLAND, D. F. Egg-tooth of the snakes and lizards. P. v. 2, p. 28-32, 186, 1 pl. Rd June 21.
- ANON. Field meeting at Manchester. P. v. 2, p. 33-7. July 18.
- ANON. Field meeting at Danvers. P. v. 2, p. 40-1. Sept. 13.
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- ANON. Field Meeting at Reading. P. v. 4, p. 146-49. Rd July 13.
- ANON. Field meeting at Georgetown. P. v. 4, p. 150-55. Rd July 27.
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OWEN'S SURVEY OF WISCONSIN, IOWA, AND MINNESOTA (1848)

History

In 1848, David Dale Owen was ordered by the United States Treasury Department to continue the surveys begun in his: "OWEN'S SURVEY CHIPPEWA LAND DISTRICT OF WISCONSIN (1847)", q.v., the Report of which was published in 1848.

Owen's assistants during the period of the newer survey which embraced Wisconsin, Iowa and Minnesota and a part of Nebraska, were J. G. Norwood, John Evans, B. F. Shumard, B. C. Macy, Charles Whittlesey, Henry Pratten, F. B. Meek, J. Beal, G. K. Warren, A. Litton, Richard Owen. Descriptions for the Final Report were also provided by Joseph Leidy in palaeontology, C. C. Parry, John Torrey, S. B. Mead and W. S. Sullivant in botany. Work was carried on between 1848 and 1850. Owen submitted a preliminary report in 1849. His Final Report was submitted under date of October 30, 1851.

The Final Report was issued in 1852 in a large quarto volume, with an added volume of illustrations, of which G. P. MERRILL, says: "The illustrations of the fossil remains are of particular interest, being medal-ruled on steel, the first of their kind produced in America "

For critical review of the geological contents of the Report see also MERRILL. (See Annot Bib.). p. 413-14.

See below, PAPERS IN SOCIETY TRANSACTIONS, for papers published in other places, previous to the appearance of the Final Report. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 273-76.

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For Contents, see OWEN'S SURV. CHIPPEWA LAND DIST. (1847).

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- p. 209-418 NORWOOD, J. G. Geological report of a survey of portions of Wisconsin and Minnesota made during the years 1847, '48, '49, and '50, under the direction of D. D. Owen. . . .
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- p. 421- 73 WHITTLESEY, Charles. Geological report on that portion of Wisconsin bordering on the south shore of Lake Superior surveyed in the year 1849 under the direction of David Dale Owen.
 - p. 425-50 General geology of the district . . . ch. 1.
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 - p. 471-73. Lumbering on the waters of Green Bay.

- p. 475-531 SHUMARD, B. F. Geological report of local, detailed observations, in the valleys of the Minnesota, Mississippi and Wisconsin Rivers made in the years 1848 and 1849 under the direction of David Dale Owen, U. S. Geologist.
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- p. 533- 72 LEIDY, Joseph. Description of the remains of extinct Mammalia and Chelonia from Nebraska Territory collected during the Geological Survey under the direction of Dr. D. D. Owen.

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- p. 573- 87 OWEN, D. D. Description of new and imperfectly known genera of species of organic remains, collected during the Geological Surveys of Wisconsin, Iowa and Minnesota. art. 1.
- p. 587- 98 OWEN, D. D., and SHUMARD, B. F. Descriptions of one new genus and twenty-two new species of Crinoidea from the Sub-Carboniferous limestone of Iowa. art. 2.
- p. 598-600 OWEN, D. D. Summary of the distribution of orders, genera and species in the Northwest. art. 3.
- p. 600- 6 ———. Additional chemical examinations. art. 4.
- p. 606- 22 PARRY, C. C. Systematic catalogue of plants of Wisconsin and Minnesota made in connection with the Geological Survey of the Northwest during the season of 1848. art. 5.
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- p. 622- 34 PRATTEN, Henry. Systematic catalogue of birds observed in northern Wisconsin and Minnesota. art. 6.
- p. 635- 38 Index.

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UNITED STATES AND MEXICAN BOUNDARY SURVEY (1848)

History

The survey of the boundary between the United States and Mexico, known as the UNITED STATES AND MEXICAN BOUNDARY SURVEY, was first begun in 1848 by virtue of the treaty between the two governments dated February 2, 1848, at Guadalupe Hidalgo.

Between 1848 and 1853 the United States sent as its commissioners in charge of the survey R. B. Campbell, Col. J. D. Graham, and J. R. Bartlett. Work was carried on under great difficulties through 1853, owing to the mismanagement of the affairs of the Commission, general disorganizations, changes in personnel, etc. On August 15, 1854, W. H. Emory, who had been Astronomer of the Expedition was appointed United States Commissioner, and completed the Survey, by virtue of the act passed Dec. 30, 1853.

Dr C. C. Parry accompanied the expedition in the capacities of botanist and geologist; and under the re-organization of the Commission was succeeded by C. B. R. Kennerly as physician and naturalist of the party. Arthur Schott, J. H. Clark, George Thurber, Charles Wright, M. T. W. Chandler, Lt. N. M. Michler, E. A. Phillips, John Potts, Maj. William Rich, Charles Radzimirski, Capt. Van Vliet were also attached to the Survey at various periods and made natural history collections. Schott was the scientist of the survey.

A final report in three volumes of the work of the survey was published in 1857-59 in both a House and a Senate edition. The natural history collections were described by James Hall, George Engelmann, Charles Girard, T. A. Conrad, John Torrey, S. F. Baird, J. L. Le Conte, Robert Kennicott, C. C. Parry, D. C. Eaton, Chester Dewey, W. H. Emory, and Asa Gray.

Other collections in the Survey were made by T. H. Webb, Dr Luis Berlandier, Lt. D. N. Couch. The Survey was completed in 1855, after seven years of operations under four commissioners. The new Gadsden treaty of Dec. 30, 1853 was the basis for the renewal of the survey in 1854.

For details of the routes followed and the regions explored, see WARREN, p. 82-5. For a brief critical note on the geology, see MERRILL. First 100 yrs. Amer. Geol. 1924. p. 338-39.

The Zoological collections were in part described in v. 8-10, the general zoological report of the PACIFIC RAILROAD SURVEYS (1853), v. 8-10, q.v.

Over twenty papers concerning the collections of the expedition and the description of the country surveyed appeared in the current scientific journals, the majority of them before the publication of the official Report in 1857-59. See below PAPERS IN SOCIETY TRANSACTIONS.

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v. 1, 22 + 506 p.; v. 2, 17 + 624 p. Repr. London, 1854, by Routledge. 2 v.

- 1855 GRAY, A. B. Report and map . . . relative to the Mexican Boundary. Washington, 1855. 50 p. (In U. S. 33rd Cong., 2d sess., Sen. Ex. Doc. v. 7, no. 55) Serial no. 752.

Report

- (1) Senate ed., Serials no. 832, 833, 834.
1857 EMORY, William H[elmsley]. . . . Report on the United States and Mexican Boundary Survey, made under the direction of the Secretary of the Interior. Washington, A. O. P. Nicholson, 1857-

59. 2 v. in 3, illus. 350 pl. maps, tab. charts, sect. diagr. 4°. (In U. S. 34th Cong., 1st sess., Sen. Ex. Doc. v. 20, no. 108, 3 parts) Serials no. 832, 833, 834.

v. 1, 1857, 16 + 258 + 8 + 174 p.

v. 2, 1858, 270 + 78 p.

v. 3, 1859, 62 + 33 + 35 + 85 p.

(2) House ed., Serials no. 861, 862, 863.

———. Same . . . Washington, Cornelius Wendell, printer, 1857-59. 2 v. in 3, illus. 350 pl. maps, tab., charts, sect., diagr. (In U. S. 34th Cong., 1st sess., H. Ex. Doc. v. 14, no. 135, 3 parts) Serials, no. 861, 862, 863.

SUMMARY OF CONTENTS:

- v. 1, pt. 1 Narrative of the Survey
- pt. 2 Geological reports
- v. 2, pt. 1 Botany of the Boundary
- (v. 3), pt. 2 Zoology of the Boundary

CONTENTS:

v. 1, pt. 1, Serial no. 832 or 861, 1857.

EMORY, W. H. Narrative of the expedition. . . . Wash. 1857. 16 + 258 p. illus. 80 pl. maps. tab. diagr.

CONTENTS:

- pref. p. 1- 6 Document.
- pref. p. 7-11 Contents.
- pref. p. 13- 6 Prefatory remarks.
- p. 1- 22, ch. 1 EMORY, W. H. Personal account . . .
- p. 23- 5, ch. 2 ———. Personal account (cont.) . . .
- p. 26- 38, ———. Journal of the joint commission.
- p. 39- 52, ch. 3 ———. General description of the country.
- p. 53- 73, ch. 4 ———. Lower Rio Bravo.
- p. 74- 92, ch. 5 MICHLER, N. From mouth of Devil's River to El Paso del Norte. p. 74-80.
- p. 80-4 CHANDLER, M. T. W. San Vicente to Presidio del Norte.
- EMORY, W. H. Report. p. 85-92.
- p. 93-100, ch. 6 ———. Sketch of territory acquired by treaty of Dec. 30, 1853.
- p. 101- 25, ch. 7 MICHLER, N. M. Report . . . from 111th meridian of longitude to Pacific Ocean.
- p. 125- 30 PARRY, C. C. Reconnaissance to the mouth of the Gila River, from San Diego, California, Sept. 11, to Dec. 10, 1849.

- p. 130-36 EMORY, W. H. Report resumed . . .
 p. 137-245, ch. 8 ———. Astronomical and geodetic work.
 p. 246-58, ch. 9 CHANDLER, M. T. W. Meteorology.

v. 1, pt. 2, **Geological Reports.** 8 + 174 p.

CONTENTS:

- p. 1-27, ch. 1 PARRY, C. C. General geological features of the country. illus.
 p. 24, note by J. W. BAILEY; p. 24-5, Thomas ANTISELL; p. 26-7, J. D. EASTER.
 p. 28-48, ch. 2 SCHOTT, Arthur. Substance of the sketch of the geology of the lower Rio Bravo del Norte. illus.
 p. 49-61, ch. 3 PARRY, C. C. Geological features of the Rio Grande Valley from El Paso to the mouth of the Pecos River. illus.
 p. 62-77, ch. 4 SCHOTT, Arthur. Geological observations on the country along the boundary line lying between the 111th degree of longitude and the initial point on the Rio Colorado. illus.
 p. 78-99, ch. 5 SCHOTT, Arthur, and EMORY, W. H. Physical and geological description of the country from the initial point on the Pacific to the junction of the Gila and Colorado. illus.
 p. 101-40 HALL, James. . . . Geology and palaeontology of the bounday . . .
 Collections made by Parry, presented in 1853.
 p. 141-74 CONRAD, T. A. Descriptions of Cretaceous and Tertiary fossils. 21 pl. [91 fig.]

v. 2, 1859, **Serial no. 833 or 862.**

pt. 1 **Botany.** 270 + 78 p.

CONTENTS:

- p. 7-26 PARRY, C. C. Introduction to the botany of the boundary survey.
 p. 27-270 TORREY, John. . . . Botany of the Boundary. 61 pl. [346 fig.]
 p. 229-32 DEWEY, Chester. Genus *Carex*.
 p. 233-36 EATON, D. C. *Equisitaceae*.
 p. 237-59 Index.
 78 p. ENGELMANN, George. . . . Cactaceae of the Boundary. 78 p. 76 pl. [494 fig.]
 Repr. in his PAPERS; ed. by Trelease. 1887. p. 176-220.

[v. 3] or v. 2, pt. 2, **Serial no. 834 or 863.**

Zoological Report. 62 + 33 + 35 + 85 + 2 p. 128 pl. [724 fig.]

See also PACIFIC RR. SURV. (1853), v. 8-10.

CONTENTS:

(1) Mammals

BAIRD, S. F. . . . Mammals of the Boundary . . . with notes by the naturalists of the Survey . . . 62 p. 27 pl. [62 fig.]

Notes by C. B. R. KENNERLY, Arthur SCHOTT, Dr. BERLANDIER, and J. H. CLARK.

(2) Birds

———. . . . Birds of the boundary . . . with notes by the naturalists of the Survey . . . 33 p. 25 pl. [43 fig.]

Notes by Lt. D. N. COUCH, KENNERLY & CLARK.

(3) Reptiles

———. . . . Reptiles of the . . . Boundary . . . with notes by the naturalists of the survey . . . 35 p. 41 pl. [291 fig.]

Notes by Charles GIRARD, KENNICOTT, and others.

(4) Ichthyology

GIRARD, Charles. Ichthyology of the Boundary . . . 85+2 p. 41 pl. [418 fig.]

Papers in Society Transactions

- 1850 GRAY, Asa. *Plantae Wrightianae Texano-Neo-Mexicanae*: an account of a collection of plants made by Charles Wright in an expedition from Texas to El Paso, New Mexico in the summer and autumn of 1849 . . . part 1 & 2.

Acc. by Smith. Inst. (1846), Mar. 1850 & Oct. 1852. In its Contributions to Knowledge. v. 3, 146 p. 10 pl. Mar. 1852; & v. 5, art. 6, 119 p. 4 pl. Feb. 1853.

- 1851 EMORY, W. H. Notes on the survey of the boundary line between the United States and Mexico.

Rd before Amer. Assoc. Adv. Sc. (1848), May 8, 1851. In its Proc. v. 5, p. 94-104.

- 1852 BAIRD, S. F., and GIRARD, Charles. Characteristics of some new Reptiles in the Museum of the Smithsonian . . .

Rd before Phila. Acad. Nat. Sc. (1812), Apr. 20, 1852. In its Proc. v. 6, p. 68-70, 125-29, 173.

———. Species collected by John H. Clark and Arthur Schott, on the United States and Mexican Boundary Survey, under Major W. H. Emory, and received too late for insertion in their proper places.

Acc. by Smith. Inst. (1846), Nov. 1852. In its Misc. Coll. v. 2, art. 5, p. 156-61. Jan. 1853.

ENGELMANN, George. Notes on the *Cereus giganteus* of southeastern California, and some other Californian Cactaceae.

In Amer. J. Sc. (1818), v. 64 (ser. 2, v. 14), p. 335-39. Nov. 1852.

- 1853 LE CONTE, J. L. Descriptions of twenty new species of Coleoptera inhabiting the United States.

Rd before Phila. Acad. Nat. Sc. (1812), Jan. 11, 1853. In its Proc. v. 6, p. 226-35.

GRAY, Asa. Brief characters of some new genera and species of Nyctaginaceae, principally collected in Texas and New Mexico, by Charles Wright under the direction of Charles Graham . . .

In Amer. J. Sc. (1818), v. 65 (ser. 2, v. 15), p. 259-63, 319-24. Mar. 1853.

BAIRD, S. F., and GIRARD, Charles. Descriptions of new species of fishes collected by J. H. Clark, on the U. S. & Mexican Boundary Survey . . .

Rd before Phila. Acad. Nat. Sc. (1812), Aug. 16, 1853. In its Proc. v. 6, p. 387-90.

LE CONTE, J. L. Descriptions of some new Coleoptera from Texas chiefly from the collections of the Mexican Boundary Commission.

Rd before Phila. Acad. Nat. Sc. (1812), Dec. 6, 1853. In its Proc. v. 6, p. 439-48.

- 1854 BAIRD, S. F., and GIRARD, Charles. Descriptions of new species of fishes collected in Texas, New Mexico and Sonora by J. H. Clark of the U. S. & Mexican Boundary Survey and in Texas by Stewart Van Vliet, part 2.

Rd before Phila. Acad. Nat. Sc. (1812), Mar. 7, 1854. In its Proc. v. 7, p. 24-9.

LE CONTE, J. L. Notes of some coleopterous insects from the collection of the Mexican Boundary Commission.

Rd before Phila. Acad. Nat. Sc. (1812), May 16, 1854. In its Proc. v. 7, p. 79-85.

GRAY, Asa. *Plantae Novae Thurberianae*: The characters of some new genera and species of plants in a collection made by George Thurber, Esq., of the late Mexican Boundary Commission, chiefly in New Mexico and Sonora.

Com. to Amer. Acad. A. & Sc. (1780), Aug. 9, 1854.

In its Mem. n. s. v. 5, pt. 2, p. 297-328. 1855. Abstr. in its Proc. v. 3, p. 159-60.

LE CONTE, J. L. Description of new Coleoptera collected by T. H. Webb, M.D., in 1850-52, while Secretary to the U. S. & Mexican Boundary Commission.

Rd before Phila. Acad. Nat. Sc. (1812), Dec. 9, 1854. In its Proc. v. 7, p. 220-25.

- 1855 CONRAD, T. A. Descriptions of one Tertiary and eight new Cretaceous fossils from Texas in the collection of Major Emory.

Rd before Phila. Acad. Nat. Sc. (1812), Feb. 13, 1855. In its Proc. v. 7, p. 268-69.

BAIRD, S. F. Characteristics of some new species of Mammalia, collected by the U. S. & Mexican Boundary Survey under W. H. Emory: part 1.

Rd before Phila. Acad. Nat. Sc. (1812), Apr. 24, 1855. In its Proc. v. 7, p. 331-33.

- 1856 SCHOTT, Arthur. Geological observations on the Pluto-volcanic slope of the Sierra Madre along the azimuth boundary line through northwest Sonora, made under the direction of W. H. Emory.
Rd before Amer. Assoc. Adv. Sc. (1848), Aug. 1856. In its Proc. v. 10, p. 25-50.
- EMORY, W. H. General description of the country adjacent to the boundary between the United States and Mexico.
Rd before Amer. Assoc. Adv. Sc. (1848), Aug. 1856. In its Proc. v. 10, p. 134-48.
- 1857 HALL, James. Observations upon the Cretaceous strata of the United States with reference to the relative position of the fossils collected by the Boundary Commission.
In Amer. J. Sc. (1818), v. 74 (ser. 2, v. 24), p. 72-86, illus. July, 1857.
- EMORY, W. H. On a feature in the range of the western mountain system of North America.
Rd before Amer. Assoc. Adv. Sc. (1848), Aug. 1857. In its Proc. v. 11, p. 56-7.
- 1858 LE CONTE, J. L. Description of new species of Coleoptera collected by the United States and Mexican Boundary Commission under W. H. Emory.
Rd before Phila. Acad. Nat. Sc. (1812), Mar. 16, 1858. In its Proc. v. 10, p. 58-89.
- GIRARD, Charles. Notes upon various new genera and new species of fishes in the Museum of the Smithsonian Institution and collected in connection with the United States and Mexican Boundary Survey . . .
Rd before Phila. Acad. Nat. Sc. (1812), July 20, 1858. In its Proc. v. 10, p. 167-71.
- LE CONTE, J. L. Catalogue of the Coleoptera of the regions adjacent to the boundary line between the United States and Mexico.
Rd before Phila. Acad. Nat. Sc. (1812), Oct. 19, 1858. In its Jour. n.s. v. 4, p. 9-42, 1 pl. [19 fig.] Dec. 1858.
This Catalogue was not published in the Official Report of the Commission.

FOSTER & WHITNEY'S U. S. SURVEY OF THE LAKE SUPERIOR LAND DISTRICT (1849)

History

" . . . At the subsequent session of Congress, an act was passed, entitled: 'An act to establish a new land district, and to provide for the sale of mineral lands in the state of Michigan' approved March 1, 1847.

"By the first section of this act, all of that portion of the Public Lands in the state of Michigan lying north of the boundaries of the Saginaw and Grand River land districts in the state, known as the north peninsula, with the islands in Lake Superior, Huron and Michigan, and in Green Bay, the straits of Michillimackinac, and the river St. Mary's, within the jurisdiction of said state, was included in one land district, to be called the Lake Superior Land District.

"The second section provides that the Secretary of the Treasury cause a geological examination and survey to be made and reported to the Commission of the General Land Office; that the President be authorized to cause such of said lands as may contain copper, lead, or other valuable ores to be exposed for sale . . . with a brief description of the lands to be offered. . . .

"In the spring of 1847, pursuant to the provision to the above recited act, the Secretary of the Treasury appointed Dr. Charles T. Jackson to execute the survey. After having spent two seasons in the field, (see JACKSON'S U. S. SURV. MINERAL LANDS OF MICHIGAN (1847)), in prosecuting this work, he resigned, and its completion was confided to Messrs J. W. Foster and J. D. Whitney, the results of whose observations will be found in the subjoined Report. . . ." FOSTER & WHITNEY. Report. pt. 1, 1850. p. 15-16.

They were assisted by Edward Desor, William Schlatter, as draughtsman, William D. Whitney as botanist, S. W. Hill, John and W. A. Burt, Charles Whittlesey. Reports were also made by James Hall and I. A. Lapham.

The Final Report was issued in two parts in 1850 and 1851 respectively. See Contents below. For a critical estimate of the geological aspects of the Reports, see also MERRILL (1), p. 417-22. (See Annot. Bib.). See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 280-84.

For several papers published prior and subsequent to the Final Report, see below PAPERS IN SOCIETY TRANSACTIONS.

Reports

Part 1, Serial no. 578

- 1850 FOSTER, J[ohn] W[ells], and WHITNEY, J[osiah] D[wight]. Report on the geology and topography of a portion of the Lake Superior land district in the state of Michigan . . . part 1: Copper

lands. Washington, 1850. 224 p. illus. 12 pl. map. (In U. S. 31st Cong., 1st sess., H. Ex. Doc. v. 9, no. 69) Serial no. 578.

Rev. in Amer. J. Sc. v. 62 (ser. 2, v. 12), p. 222-39. Sept. 1851; & v. 65 (ser. 2, v. 15), p. 295-96. Mar. 1853.

CONTENTS:

p. 5- 17,	Introduction.
p. 18- 38, ch. 1	Physical geography.
p. 39- 57, 2	Climate
p. 58- 98, 3	Geology of the copper region
p. 99-122, 4	Stratified sedimentary rocks
p. 123- 57, 5	Mines and mining
p. 158- 63, 6	Ancient mining
p. 164- 76, 7	Veins and veinstones
p. 177- 85, 8	Metallurgy
p. 186- 97 9	Drift of the Lake Superior land district
p. 198-218 10	Drift (cont.)
p. 219- 24	Glossary of mining and metallurgic terms

Part 2, Serial no. 609

1851 FOSTER, J[ohn] W[ells], and WHITNEY, J[osiah] D[wight]. . . . Report on the geology of the Lake Superior land district; part 2: The Iron Region, together with the general geology. Washington, Printed by A. Boyd Hamilton, 1851. 406 p. illus. 35 pl. 3 maps. (In U. S. 32d Cong., Spec. sess., Sen. Ex. Doc. v. 3, no. 4) Serial no. 609.

For rev. see above, pt. 1.

Extracts in Amer. J. Sc. (1818), v. 67, (ser. 2, v. 17), p. 11-33. Jan. 1854.

CONTENTS:

p. 1- 7, ch. 1	FOSTER & WHITNEY. Classification and nomenclature of the rocks.
p. 8- 35, 2	———— Azoic system.
p. 36- 49, 3	———— Granite rocks of the Azoic period.
p. 50- 69, 4	———— Iron ores and associated rocks.
p. 70- 84, 5	———— Economic geology of the Azoic series.
p. 85- 94, 6	———— Composition of the Trappean rocks.
p. 95-109, 7	———— Mineralogy.
p. 110- 39, 8	———— Lower Silurian system—Potsdam and calciferous sandstone.

Notes by James HALL.

Part 2: (cont.)

p. 140- 41, 9	HALL, James. Lower Silurian system (cont.)
p. 152- 66, 10	———— Upper Silurian and Devonian series.

- p. 167- 89, 11 FOSTER & WHITNEY. Miscellaneous observations on the Palaeozoic series.
 p. 167-71 LAPHAM, I. A. On the geology of the southeastern portion of the state of Wisconsin, being a part not surveyed by the U. S. geologists.
 p. 174-83 WHITTLESEY, Charles. Remarks upon the section from the Falls of Wolf River, through Navarino to Lake Michigan.
- p. 190-202, 12 ————— Chemistry and economic geology of the Palaeozoic series.
- p. 203- 31, 13 HALL, James. Description of new or rare species of fossils, from the Palaeozoic series.
- p. 232- 47, 14 DESOR, Edward. On the superficial deposits of this district.
- p. 248- 55, 15 ————— Same (cont.)
 Assisted by WHITTLESEY.
- p. 256- 73, 16 ————— Same (cont.)
- p. 274- 84, 17 FOSTER & WHITNEY. On the elevation of mountain chains.
- p. 285-318, 18 HALL, James. Parallelism of the Palaeozoic deposits of the U. S. & Europe.
- p. 319- 39, 19 WHITTLESEY, Charles. On the observed fluctuations of the surfaces of the lakes.
- p. 340- 58, 20 ————— Magnetic variations, comparison of terrestrial & astronomical measurements.
- p. 359- 81 21 WHITNEY, W. D. Botany.
- p. 385-400 Appendix: notes.
- p. 401- 6 Index.

Papers in Society Transactions

- 1849 WHITNEY, J. D. An account of labors during the past summer as U. S. Geologist in the survey of the government lands on Lake Superior.
 Rd before Bost. Soc. Nat. Hist. (1830), Dec. 19, 1849. In its Proc. v. 3, p. 210-12.
- 1851 HALL, James. Some account of investigations . . . on Drummond's Island, and the north shore of Lake Huron and Lake Michigan, in connection with the geological survey under the direction of Messrs Foster & Whitney.
 Rd before Amer. Acad. A. & Sc. (1780), Jan. 7, 1851. In its Proc. v. 2, p. 253-54.
- FOSTER, J. W., and WHITNEY, J. D. On the age of the sandstone of Lake Superior, with a description of the phenomena of the association of igneous rocks.
 Rd before Amer. Assoc. Adv. Sc. (1848), May 6, 1851. In its Proc. v. 5, p. 22-38.

— On the Azoic system as developed in the Lake Superior Land District.

Rd before Amer. Assoc. Adv. Sc. (1848), May 5, 1851. In its Proc. v. 5, p. 4-7. 1851.

- 1852 DESOR, Edward. On the drift of Lake Superior.

In Amer. J. Sc. (1818), v. 63, (ser. 2, v. 13), p. 93-109. Jan. 1852.

- 1854 HALL, James. On the Silurian system of the Lake Superior region.

In Amer. J. Sc. (1818), v. 67 (ser. 2, v. 17), p. 181-94. Mar. 1854.

FOSTER, J. W. Catalogue of rocks, minerals, etc., collected by . . . and deposited in the Smithsonian Institution.

In Smith Inst. (1846), Ann. Rept. v. 9, p. 384-87. 1854.

- 1859 WHITNEY, J. D. Notice of new localities, and interesting varieties of minerals, in the Lake Superior regions; supplementary to the chapter on the subject in pt. 2, of the "Report of Foster & Whitney."

In Amer. J. Sc. (1818), v. 78 (ser. 2, v. 28), p. 8-20, illus. July, 1859. Repr. in Mining Mag. (1853), ser. 2, v. 1, p. 32-47. Nov. 1859.

- 1865 KIMBALL, J. P. On the iron ores of Marquette, Michigan.

In Amer. J. Sc. (1818), v. 89 (ser. 2, v. 39), p. 290-303. May, 1865.

GILLISS'S U. S. NAVAL ASTRONOMICAL EXPEDITION (1849)

History

By virtue of an Act passed August 3, 1848, it was proposed "to set on foot an expedition to the most southern available position on the western continent, for the purpose of making observations on the planet Venus. . . ."

Under the supervision of James Melville Gilliss, the United States Naval Astronomical Expedition left New York August 16, 1849, for a four years' cruise for the purpose of carrying out the provisions of the above act. His chief assistants were Lt. Archibald McRea, S. L. Phelps and E. R. Smith. Although there were no naturalists aboard the ships during the expedition, collections, botanical, zoological and ethnological were made and turned over to the SMITHSONIAN INSTITUTION (1846), q.v., for description. Reports were rendered by S. F. Baird, John Cassin, Charles Girard, J. L. Smith, Thomas Ewbank, A. A. Gould, Asa Gray, W. D. Brackenridge, Jeffries Wyman and T. A. Conrad.

Gilliss's "Final Report" appeared in 1855-56 in four volumes, parts 1-3, and 6. Parts 4-5, astronomical volumes were not pub-

lished until 1895 (see Reports (2), below). His Report was submitted July, 1854. For several papers appearing before the Final Report, see below PAPERS IN SOCIETY TRANSACTIONS.

Reports

(1), pt. 1-3, 6

- 1855 GILLISS, James M[elville]. . . . The U. S. Naval Astronomical Expedition to the Southern Hemisphere, during the years 1849, '50, '51, '52. . . . Washington, A. O. P. Nicholson, printer, 1855-56. 4 v. illus. pl. maps, port. tab. 4°. (In U. S. 33d Cong, 1st sess., H. Ex. Doc. v. 15, no. 121, pt. 1-3, 6) Serials no. 728, 729, 730, 733.

Rev. in Amer. J. Sc. v. 71 (ser. 2, v. 21), p. 147-48. Jan. 1856.

CONTENTS:

v. 1, Serial no. 728

GILLISS, J. M. Chile: its geography, climate, earthquakes, government, social condition, mineral and agricultural resources, commerce . . . 15 + 556 p.

- p. 1- 43, ch. 1, Descriptive geography
- p. 94-128, ch. 4, Earthquakes
- p. 297-303, ch. 11, Mineral Springs
- p. 402-511, Narrative

v. 2, Serial no. 729, On Argentine. 11 + 300 p. 42 pl.

CONTENTS:

- p. 1- 82 McRAE, Archibald. Report of a journey across the Andes and Pampas of the Argentine Provinces.
- p. 83-107 SMITH, J. L. . . . Report on the minerals and mineral waters of Chile. Appx. D.
- p. 109- 50 EWBANK, Thomas. A description of the Indian antiquities brought from Chile and Peru by the Astronomical Expedition . . . illus. 3 pl. Appx. E.
- p. 153- 71 BAIRD, S. F. Mammals. 1 pl. Appx. F. Mammalia in Chile, p. 163-71.
- p. 172-206 CASSIN, John. Birds. Appx. F. 15 col. pl.
- p. 207- 29 GIRARD, Charles. Reptiles. Appx. F. 7 pl.
- p. 230- 53 ———— Fishes. Appx. F. 5 pl.
- p. 254- 62 ———— Description of certain Crustacea brought home by the Expedition. . . Appx. F.
Note on Appx. F., by P. L. SCLATER, in Zool. Soc. London. Proc. 1856, p. 18, 19.
- p. 263 GOULD, A. A. List of shells . . . Appx. F.
- p. 265- 69 GRAY, Asa. List of the dried plants brought from Chile . . . Appx. G.

- p. 270- 71 BRACKENRIDGE, W. D. List of living plants and seeds sent from Chile to the government green house. Appx. G.
- p. 273- 81 WYMAN, Jeffries. Palaeontology: Description of a portion of the lower jaw and a tooth of the Mastodon Andium; also of a tooth and fragment of a femur of a Mastodon from Chile. Appx. H. 2 pl.
- p. 282- 86 CONRAD, T. A. Remarks on the fossil shells collected by Lt. Gilliss, with descriptions of the species. Appx. H. 2 pl.

v. 3, Serial no. 730

- GILLISS, J. M. Origin and operations of the Expedition. 6 + 42 p.
 ———— Observations to determine the Solar Parallax. 492 p.

v. 6, Serial no. 733

- Magnetical and meteorological observations. 1856. 48 + 420 p.

(2), pt. 4-5, Serial no. 3424

- 1895 GILLISS, James M[elville]. A catalogue of 16,748 southern stars deduced by the U. S. Naval Observatory from the zone observations made at Santiago de Chile. . . Washington, 1895. 66 + 420 p. pl. (In U. S. 54th Cong., 1st sess., H. Doc. no. 219, appx. 1) Serial no. 3424.
 This comprehends the unpublished v. 4-5, of the Expedition.

Papers in Society Transactions

- 1853 WYMAN, Jeffries. Lower jaw of a Mastodon from South America brought from Chili by Lt. Gilliss.
 Rd before Amer. Acad. A. & Sc. (1780), Dec. 13, 1853. In its Proc. v. 3, p. 68.
- 1854 GIRARD, Charles. Abstract of a Report to Lt. J. M. Gilliss upon the fishes collected during the U. S. Naval Astronomical Expedition to Chile.
 Rd before Phila. Acad. Nat. Sc. (1812), Nov. 21, 1854. In its Proc. v. 7, p. 197-99.
 ———— Abstract of a Report to Lt. J. M. Gilliss upon the reptiles collected during the U. S. Naval Astronomical Expedition to Chili.
 Rd before Phila. Acad. Nat. Sc. (1812), Dec. 12, 1854. In its Proc. v. 7, p. 226-27.
- 1856 GILLISS, J. M. On the earthquake of Apr. 2, 1851, in Chile.
 . In Amer. J. Sc. (1818), v. 71 (ser. 2, v. 21), p. 388-99. May, 1856.

MARCY'S EXPEDITION FROM FORT SMITH TO SANTE FE
 (1849)

History

Capt. R. B. Marcy conducted an expedition between April and November, 1849, from Fort Smith, Arkansas to Santa Fe, New

Mexico. For route followed, see WARREN, p. 57. (see Annot. Bib. v. 1.) His Report was published in 1850 in the forms noted below.

Report

(1) Serial no. 562.

1850 MARCY, Randolph B[arnes]. Report . . . of the route from Fort Smith to Santa Fe. . . . Washington, 1850. (In U. S. 31st Cong., 1st sess., Sen. Ex. Doc., v. 14, no. 64, p. 169-233) Serial no. 562.

(2) Serial no. 577.

———. Same. . . . Washington, 1850. (In U. S. 31st Cong., 1st sess., H. Ex. Doc. v. 8, no. 45, p. 26-89) Serial no. 577.

POPE'S EXPLORATION OF MINNESOTA (1849)

History

On May 16, 1849, Lt. John Pope left St. Louis for an exploration of the valley of the Red River of the North in the state of Minnesota. His party returned October 5, of the same year. His Report was published in 1850. It contains some geological observations, but nothing on the fauna or flora of the region as these had been previously described in the reports of NICOLLET'S EXPLOR. UPPER MISSISSIPPI (1836), q.v., and LONG'S EXPED. TO THE ST. PETER'S (1823), q.v.

Report

1850 POPE, John. . . . Report of an exploration of the territory of Minnesota. Wash. 1850. 56 p. map. (In U. S. 31st Cong., 1st sess., Sen. Ex. Doc. v. 10, no. 42) Serial no. 558.

RECONNAISSANCES OF ROUTES FROM SAN ANTONIO TO EL PASO (1849)

History

During 1849 and 1850 a series of reconnaissances for the determination of routes from San Antonio to El Paso, Texas, were carried out by Capt. J. E. Johnston, Lt. W. F. Smith, F. T. Bryan, N. H. Michler., Capt. S. G. French, and Lt. W. H. C. Whitney.

The various reports were published in 1850. For details of routes followed, see WARREN, p. 60-2, (see Annot. Bib. v. 1).

Very little of importance in natural history was accomplished by this group of reconnaissances.

Reports

- 1850 ANDERSON, J. S., and others. . . . Reports of the Secretary of War with reconnaissances of routes from San Antonio to El Paso, by Brevet Col. J. E. Johnston, Lt. W. F. Smith, Lt. F. T. Bryan, Lt. N. H. Michler, and Capt. S. G. French; also the Report of Capt. R. B. Marcy's route from Fort Smith to Santa Fe; and the Report of Lt. J. H. Simpson of an expedition into the Navajo country; and the report of Lt. W. H. C. Whitney's Reconnaissances of the western frontier of Texas. Washington, 1850. 250 p. 75 pl. maps. (In U. S. 31st Cong., 1st sess., Sen. Ex. Doc. v. 14, no. 64) Serial no. 562.

See also MARCY'S EXPED. FORT SMITH TO SANTA FE (1849)

See also SIMPSON'S SURV. ROUTE FORT SMITH TO SANTA FE & EXPED. TO NAVAJO COUNTRY (1849)

CONTENTS:

p. 4- 7, 13- 4	SMITH, W. F.	Report . . . May 25, 1849.
p. 7- 13, 29-40	MICHLER, N. H.	Report . . . July 31, 1849, and Jan. 28, 1850.
p. 14- 26	BRYAN, F. T.	Report . . . Dec. 1, 1849.
p. 26- 9	JOHNSTON, J. E.	Report . . . Dec. 28, 1849.
p. 40- 54	FRENCH, S. G.	Report . . . Jan. 28, 1850.
p. 55-168	SIMPSON, J. H.	Report . . . Apr. 11, 1850.
p. 169-233	MARCY, R. B.	Report . . .
p. 235- 50	WHITNEY, W. H. C.	Report . . .

SIMPSON'S SURVEY OF A ROUTE FROM FORT SMITH TO SANTA FE; & A MILITARY RECONNAISSANCE FROM SANTA FE TO THE NAVAJO COUNTRY (1849)

History

In 1849, Lt. J. H. Simpson, assisted by R. M. and E. H. Kern, and J. F. Hammond, who made natural history collections, made a survey of the route lying between Fort Smith, Arkansas and

Santa Fe, New Mexico, and from Santa Fe, conducted a military reconnaissance into the Navajo country in northwest New Mexico. His Reports were rendered in 1850. For details of routes followed, see also WARREN, p. 56-7, (see Annot. Bib. v. 1).

Bibliography

- 1852 SIMPSON, J. H. Annual address . . . on the main incidents connected with an expedition into the Navajo country made in 1849. . . . (In Minn. Hist. Soc. Annals, 1852. p. 5-19)

Reports

A. Fort Smith to Santa Fe.

(1) House ed., Serial no. 577.

- 1850 SIMPSON, J[ames] H[ervey]. Report of exploration and survey of route from Fort Smith, Arkansas, to Santa Fe, New Mexico, made in 1849. Washington, 1850. (In U. S. 31st Cong., 1st sess., H. Ex. Doc. v. 8, no. 45, p. 1-25, 2 pl. map) Serial no. 577.

Report rendered Aug. 13, 1849.

(2) Senate ed., Serial no. 554.

———. Same . . . Washington, 1850. (In U. S. 31st Cong., 1st sess., Sen. Ex. Doc. v. 6, no. 12. 25 p.) Serial no. 554.

B. Santa Fe to Navajo Country.

- 1850 ————. Journal of a military reconnaissance from Santa Fe, New Mexico to the Navajo Country. Washington, 1850. (In U. S. 31st Cong., 1st sess., Sen. Ex. Doc. v. 14, no. 64, p. 55-168) Serial no. 562.

p. 146-48 Schedule of minerals.

STANSBURY'S EXPLORATION OF THE SALT LAKE VALLEY (1849)

History

Early in 1849, Capt. Howard Stansbury, assisted by Lt. J. W. Gunnison, was ordered on an expedition the object of which was a survey of the Great Salt Lake and an exploration of its Valley. The expedition set out in 1849 and returned in December, 1850. The start was from Fort Leavenworth in May, 1849.

There was no regular naturalist attached to the expedition, but the large collections were submitted to Messrs Baird, Torrey, Hall, L. D. Gale, S. S. Haldeman, Girard, and T. R. Peale.

Baird, in his preface to the Zoology of the Report, says: "Called upon to start almost at a day's notice, they found it utterly impracticable to obtain the proper preservative materials, apparatus and other necessary outfit for making collections, in the limited time allotted to them. Nevertheless, it will not be a matter of surprise to those who are acquainted with the gentlemen concerned to learn how much was actually accomplished as will be shown by the published results. In fact, no government expedition since the days of Major Long's visit to the Missouri, has ever presented such important additions to natural history. . . ." BAIRD, S. F. Appx. C (Report), p. 307.

The Expedition spent the winter of 1849-50 amongst the Mormons. For details of the routes followed, see also WARREN, p. 57-9, (see Annot. Bib. v. 1).

Stansbury's Final Report was rendered March 10, 1852, and published the same year.

Bibliography

- 1896 COVILLE, F. V. Three editions of Stansbury's Report. (In Torrey Bot. Club. Bull. v. '23, p. 137-39. 1896).

Report

- 1852 STANSBURY, Howard. . . . Exploration and survey of the Valley of the Great Salt Lake of Utah, including a reconnoissance of a new route through the Rocky Mountains. Phila. Lippincott, Grambo & co., 1852. 487 p. 54 pl. 3 maps. (In U. S. 32d Cong., Spec. sess., Mar. 1851. Sen. Ex. Doc. v. 2, no. 3). Serial no. 608

Rev. in Amer. J. Sc. v. 65 (ser. 2, v. 15), p. 133-35. Jan. 1853. (See also p. 126-29).

Other editions according to Coville (see above), bear imprint: Wash. Robert Armstrong, 1852; & a third bears imprint date, 1855.

CONTENTS:

- p. 13-267 STANSBURY, Howard. Report and narrative. ch. 1-9. Made Mar. 10, 1852.
- p. 269- 94 ————. Tables of distances. Appx. A.
- p. 295-303 ————. Astronomy. Appx. B.
- p. 307- 8 BAIRD, S. F. Zoology of survey. Appx. C.
- p. 309- 13 ————. Mammals. Appx. C.
- p. 314- 35 ————. Birds. Appx. C.
- p. 327-35 CASSIN, John. A list of the birds inhabiting America, west of the Mississippi, not described in Audubon's "Ornithology."

- p. 336- 53 BAIRD, S. F., and GIRARD, Charles. Reptiles Appx. C. 5 pl.
- p. 354- 65 GIRARD, Charles. A monographic essay on the genus *Phrynosoma*. Appx. C. 3 pl.
- p. 366- 78 HALDEMAN, S. S. Insects. Appx. C. 2 pl.
- p. 379 PEALE, T. R. Letter upon the larvae of insects found in the Great Salt Lake. Appx. C.
- p. 381- 97 TORREY, John. Botany: catalogue of plants collected by the expedition. Appx. D. 9 pl.
- p. 399-414 HALL, James. Letter containing observations on the geology and palaeontology of the country traversed by the expedition and notes upon some of the fossils collected on the route. Appx. E. 4 pl.
Rev. in Amer. J. Sc. v. 65, (ser. 2, v. 15), p. 126-29. Jan. 1853.
- p. 415- 21 GALE, L. D. Chemical analyses. Appx. F.
- p. 423- 78 STANSBURY, Howard. Meteorological observations. Appx. G.
- p. 479- 86 Index.

U. S. SURVEYS IN CALIFORNIA AND OREGON (1849)

History

In 1849, Philip T. Tyson was requested by the War Department to make a survey of California with especial reference to its geology and topography. He rendered his Report Jan. 30, 1850, and it was published in the official government documents during the same year. A separate of the Report including those of the army officers noted below was issued in 1851.

Explorations were also carried on by Generals P. F. Smith and B. Riley; Lts. Theodore Talbot, J. F. Frazer, G. H. Derby, W. H. Warner, R. S. Williamson, E. O. Ord.

The object of Tyson's "Memoir" was "to present a brief sketch of the geological structure and industrial resources of parts of California, including those sections of the country which have recently attracted so much attention." Lt. Talbot's Report in MSS is deposited in MSS division of Library of Congress.

Reports

(1)

- 1850 CRAWFORD, George W. Report of the Secretary of War, communicating information in relation to the geology and topography

of California and Oregon . . . of part of the Sierra Nevada . . . Washington, 1850. 127 + 37 p. illus. 9 pl. 3 maps. (Serial no. 558.)

In two parts.

(2)

- 1851 TYSON, Philip T[homas]. Geology and industrial resources of California: to which is added, the official reports of Genls. Persifer F. Smith and B. Riley—including the reports of Lieuts. Talbot, Ord, Derby, and Williamson of their explorations in California and Oregon; and also of their examinations of routes for railroad communication eastward from those countries. Baltimore, Minifie & co., 1851. 34 + 127 + 37 p. 9 pl. 3 maps.

Rev. in North Amer. Rev. v. 75, p. 277-96. Oct. 1852.

CONTENTS: (1) & (2)

Part 1

- p. 1- 74 TYSON, P. T. Report . . . on the geology and topography of California . . . 9 pl. maps.
p. 6-36 Geology; p. 36-43 Mineralogy; p. 43-6 Botany; p. 46-9 Zoology.
- p. 75-108 SMITH, P. F. Report . . . Oct. 7, 1849.
- p. 108- 16 TALBOT, Theodore. Report . . . Oct. 5, 1849.
- p. 116- 17 FRAZER, J. F. Report on minerals forwarded by General Smith.
- p. 118- 19 RILEY, Bennet. Report.
- p. 119- 27 ORD, E. O. C. Report to Gen. Riley . . . Oct. 31, 1849.

Part 2

- p. 1- 16 DERBY, G. H. Topographical memoir accompanying maps of Sacramento Valley . . . Sept. 5, 1849.
- p. 16- 37 WILLIAMSON, R. S., and WARNER, W. H. Report.

U. S. SURVEY OF THE CREEK BOUNDARY LINE (1849)

History

Lt. Lorenzo Sitgreaves was ordered to make a survey of the boundary lines of the Creek Country in Kansas in 1849. Work was begun June 19, 1849. On April 18, 1850, Sitgreaves was relieved by Lt. J. C. Woodruff, who completed the survey.

S. W. Woodhouse accompanied the expedition in the capacities of physician and naturalist. Sitgreaves's Report was submitted Feb. 14, 1850; and that of Woodruff, Sept. 1, 1851. The official report was not published, however, until 1858. Woodhouse made and described the natural history collections.

Report

- 1858 SITGREAVES, L[orenzo], and WOODRUFF, J.=C. [Reports of the survey of the northern and western boundary line of the Creek country, Kansas, during the years 1849 and 1850]. Washington, 1858. 32 p. map. (In U. S. 35th Cong., 1st sess., H. Ex. Doc. v. 12, no. 104). Serial no 958.

CONTENTS:

- p. 1- 5 SITGREAVES, L. Report. Feb. 14, 1850.
 p. 5-15 WOODHOUSE, S. W. A short account of the natural history of the country, with list of plants, birds, shells . . . Written Feb. 20, 1850.
 p. 6-8, plants; p. 8-13, zoology; p. 13-15 Birds collected during the summer and fall of 1849 in Indian territory.
 p. 15-24 WOODRUFF, J. C. Report. Sept. 1, 1851.
 p. 25-32 WOODHOUSE, S. W. Report while under the command of Lieut. J. C. Woodruff. Written Jan. 6, 1851.

Papers in Society Transactions

- 1852 WOODHOUSE, S. W. Description of a new species of Ectopistes. Rd before Phila. Acad. Nat. Sc. (1812), June 1, 1852. In its Proc. v. 6, p. 104-5.

ANNUAL OF SCIENTIFIC DISCOVERY (1850)

History

The ANNUAL OF SCIENTIFIC DISCOVERY; or, Year-book in science and art, was begun in 1850 under the editorship of David Ames Wells, assisted by George Bliss. Bliss's name does not appear on the title-page after the first volume. It gave annually digests of the scientific articles appearing in the various periodicals of the day, and each volume, after the first contained an essay on the progress of science during the year just elapsed. It was the earliest successful attempt at maintaining a kind of "Science Abstracts." The publication appeared through 1871.

Below will be found the contents of the various volumes as they relate to natural history.

- 1850 (THE) ANNUAL OF SCIENTIFIC DISCOVERY; or, Year-book of facts in science and art, exhibiting the most important discoveries and improvements in mechanics, astronomy, mineralogy,

useful arts, meteorology, geology, natural philosophy, zoology, geography, chemistry, botany, antiquities; together with a list of recent scientific publications; a classified list of patents; obituaries of eminent scientific men; an index of important papers in scientific journals, reports, etc., edited by David A. Wells and George Bliss, Jr. Bost. Gould & Kendall & Lincoln, 1850-71. 21 v. (for 1850-70).

Papers on Natural History

1850	v. 1, for 1850
p. 222- 88	Geology, palaeontology & mineralogy.
p. 289-306	Botany.
p. 307- 34	Zoology.
1851	v. 2, for 1851
pref. p. 5-19	Progress of science.
p. 250-316	Geology.
p. 317- 27	Botany.
p. 328- 63	Zoology.
1852	v. 3, for 1852
pref. p. 5-24	Progress of science.
p. 243-322	Geology.
p. 323- 38	Botany.
p. 339- 72	Zoology.
1853	v. 4, for 1853
p. 5- 29	Progress of science.
p. 263-317	Geology.
p. 318- 26	Botany.
p. 327- 57	Zoology.
1854	v. 5, for 1854
p. 3- 24	Progress of science.
p. 289-332	Geology.
p. 333- 41	Botany.
p. 342- 57	Zoology.
1855	v. 6, for 1855
p. 4- 24	Progress of science.
p. 298-336	Geology.
p. 337- 49	Botany.
p. 350- 73	Zoology.
1856	v. 7, for 1856
p. 3- 22	Progress of science.
p. 280-332	Geology.
p. 333- 39	Botany.
p. 340- 63	Zoology.

1857	v. 8, for 1857	
	p. 3-18 (pref.)	Progress of science.
	p. 297-344	Geology.
	p. 345- 55	Botany.
	p. 356- 70	Zoology.
1858	v. 9, for 1858	
	pref. p. 3-20	Progress of science.
	p. 350- 80	Geology.
	p. 381- 85	Botany.
	p. 386- 93	Zoology.
1859	v. 10, for 1859	
	pref. p. 3-18	Progress of science.
	p. 294-342	Geology.
	p. 343- 54	Botany.
	p. 355- 82	Zoology.
1860	v. 11, for 1860	
	pref. p. 3-20	Progress of science.
	p. 284-366	Geology.
	p. 367- 78	Botany.
	p. 379-408	Zoology.
1861	v. 12, for 1861	
	pref. p. 3-18	Progress of science.
	p. 274-344	Geology.
	p. 345- 52	Botany.
	p. 353- 80	Zoology.
1862	v. 13, for 1862	
	pref. p. 3-18	Progress of science.
	p. 250-309	Geology.
	p. 310- 19	Botany.
	p. 320- 67	Zoology.
1863	v. 14, for 1863	
	pref. p. 3-16	Progress of science.
	p. 244- 87	Geology.
	p. 288- 93	Botany.
	p. 294-309	Zoology.
1864	v. 15, for 1864	
	pref. p. 3-14	Progress of science.
	p. 209- 52	Geology.
	p. 253-303	Zoology.
	p. 304- 15	Botany.
1865	v. 16, for 1865	
	pref. p. 5-14	Progress of science.
	p. 268-312	Geology.
	p. 313- 15	Botany.
	p. 316- 31.	Zoology.

DERBY'S RECONNAISSANCE OF THE GULF OF CALIFORNIA AND THE COLORADO RIVER & EXPEDITION TO TULARE LAKE (1850)

History

In 1850, under the direction of George H. Derby, an expedition to Tulare Lake and vicinity in California was made. Derby's Report was rendered in July, 1850, and published in 1852.

In November, 1850, he was ordered "to attempt the entrance of the Colorado River from the Gulf of California and the ascent of the river as far as the post to be established near the junction of the Gila, with a view to establish that as a route of supply . . ." Orders were given October 12, and the expedition in the "Schooner Invincible," which was despatched for the purpose, was carried out between Nov. 1850 and March, 1851. Derby's Report was published in 1852.

Reports

A. Recon. Gulf of California. Serial no. 620.

- 1852 DERBY, George H[oratio]. Report of the expedition of the United States transport "Invincible" (Capt. A. H. Wilcox) . . . to the Gulf of California and river Colorado during the months of November, December, January, February and March, 1850 and 1851. Washington, 1852. 28 p. illus. map. (In U. S. 32d Cong., 1st sess., Sen. Ex. Doc. v. 9, no. 81). Serial no. 620.

B. Expedition to Tulare Lake. Serial no. 621.

- 1852 DERBY, George H[oratio]. Report . . . of an examination of the country between the latitude of San Miguel and that of San Luis Obispo . . . Tulare Lake and vicinity. Washington, 1852. 17 p. map. (In U. S. 32d Cong., 1st sess., Sen. Ex. Doc. v. 10, no. 110). Serial no. 621.

MISSISSIPPI STATE GEOLOGICAL SOCIETY (1850)

History

According to the AMERICAN JOURNAL OF SCIENCE, v. 60 (ser. 2, v. 10), p. 133. July, 1850, an organization known as the Mississippi State Geological Society had just been formed for the purpose primarily of urging the establishment of a state geological survey.

After achieving its purpose, the Society appears to have disbanded. The first survey was carried out in 1850 under the supervision of Dr. John Millington. See MISSISSIPPI GEOL. SURV. (1850).

B. C. L. Wailes and John Millington appear to have been the most influential members of the Society during the few years of its precarious existence. It disbanded in 1854.

MISSISSIPPI GEOLOGICAL SURVEYS (1850)

History

“An Act of the Legislature entitled: ‘An act to further endow the University of Mississippi’ approved March 5, 1850, was the first authorization of a geologic survey of the state. Under this law the trustees of the University elected Dr. John Millington, at that time professor of natural sciences at that institution as the first state geologist, and B. L. C. Wailes as assistant state geologist, January 14, 1852.

This first state survey was not only a geologic and agricultural survey, but contemplated a complete biologic survey of the state as well. Dr. Millington was too old to do the active field work, and the prosecution of the survey fell principally upon Prof. Wailes. Much work of a reconnaissance character was done by Prof. Wailes in an effort to unfold the geologic structure of the state, large collections of specimens were made and a state museum was established. The fossils collected were chiefly from the Jackson and Vicksburg formations, and were determined by T. A. Conrad. When the Report was ready for publication in 1854 it embodied so largely the results of Prof. Wailes’s work that Dr. Millington thought that to publish it under his own name would be an injustice to his co-worker. His recommendation that it be published in Wailes’s name was adopted . . .

In 1854 Lewis Harper succeeded Wailes as state geologist and E. W. Hilgard was appointed assistant state geologist. During the next three years the work of the Survey was carried on by these men, chief attention being given to the economic aspects of the investigations. The results were embodied in a Report on the agriculture and geology of Mississippi in 1857.

In 1857 Hilgard succeeded Harper as state geologist. He was pre-eminently qualified for the work. Educated in Germany he had thorough and special training in chemistry and agricultural science, besides being an accomplished geologist. He studied the geologic structure of the state and the economic products and soils accurately and thoroughly. He made large and valuable collections of specimens, which are now in the cabinets of the State University.

As a result of his studies, Hilgard in 1860 published a most creditable report on the geology and agriculture of Mississippi. The Civil War broke out before the Reports were received from the St. Louis publisher and not until after the close of the war were they put into circulation.

During the Civil War, appropriations for the Survey stopped except the \$1,200 salary of the state geologist, which, though small, was continued in appreciation of the valuable services which Dr. Hilgard had given the state." From HAYES, p. 82-3. (U. S. Geol. Surv. Bull no. 465).

See also MERRILL (1), p. 430, 440-41, 483-84. (See Annot. Bib.) for critical discussions of the various Reports given below. See also MERRILL, G. P. First 100 yrs. Amer. Geol. 1924. p. 297-98, 330-31, 367-68.

The Survey was largely the outgrowth of the activity of the MISSISSIPPI STATE GEOLOGICAL SOCIETY (1850), q.v.

Oscar M. Lieber was Millington's first assistant and received his appointment effective July 15, 1851. He resigned on January 14, 1852. A paper of his on the geology of the state will be found in the PAPER IN SCIENTIFIC JOURNAL, below.

According to MERRILL (see BIBLIOGRAPHY: 1920, below), the expenses of the Mississippi Surveys totalled about \$17,445.

Bibliography

1901—HILGARD, E[ugene] W[oldemar]. A historical outline of the Geological and Agricultural Survey of the State of Mississippi. (In Amer. Geol. v. 27, no. 5, p. 284-311. May, 1901).

Bibliographical note—Official publications of the Surveys, p. 309-11.

Repr. from Mississippi Hist. Soc. Publications. v. 3, p. 207-34. 1900. (Bibliography, p. 232-34).

- 1920 MERRILL, George P[erkins], ed. *Mississippi Geological Surveys*. Washington, 1920. (In U. S. Nat. Mus. Bull. no. 109. p. 255-74, port.)

History of state surveys to 1885.

Reports

- 1854 WAILES, B[enjamin] L[eonard] C[ovington]. Report on the agriculture and geology of Mississippi, embracing a sketch of the social and natural history of the state. Jackson, Miss., E. Barksdale, printer, 1854. XX+17-371 p. illus. pl. sect.

2000 copies pub., preface dated Mar. 1, 1854. \$2500 appropriated to Wailes.

CONTENTS:

Introduction. p. XIII-XX.

I. Historical notice. p. 17-116.

II. Land titles. p. 117-25.

III. Agriculture. p. 127-205.

IV. Geology. p. 207-86, 290-96.

Palaeontology. p. 269-86.

CONRAD, T. A. Fossils of the Vicksburg Eocene beds. p. 287-88, pl. 14-17, [38 fig.]

———. Fossil Testacea of the Tertiary green-sand marl bed of Jackson, Miss. p. 289.

V. Meteorology. p. 297-308.

VI. Fauna. p. 309-40.

Assisted by Agassiz & Baird.

AGASSIZ, Louis. Catalogue of the fishes of Mississippi. p. 332-37.

VII. Flora. p. 341-56.

Appx. A. The President of the Board of Trustees of the State University to the Governor of the state. Jan. 12, 1854. p. 357.

B. Message of Gov. McRae to the Legislature, Jan. 17, 1854. p. 357-59.

C. Report of the Committee of the Senate, Jan. 20, 1854. p. 359-60.

D. An act to authorize the printing of the First Annual Report . . . p. 360-62.

E. Extracts from Dr. Millington's Report to the Governor, Feb. 1, 1854. p. 363-64.

- 1857 HARPER, Lewis. Preliminary report on the geology and agriculture of the state of Mississippi . . . Jackson, Miss., E. Barksdale, printer, 1857. 352 p. 52 illus. map.

Rept. made March, 1857.

Rev. in Amer. J. Sc. ser. 2, v. 26 p. 131-32. July, 1858.

CONTENTS:

Introduction. p. 15-27.

Geological geography of the state of Mississippi. p. 29-39.

Lithological and palaeontological description of the Carboniferous formation. p. 41-71.

Geological and palaeontological description of the Cretaceous formation. p. 72-131.

Forest growth. p. 130-31.

Lithological and palaeontological description of the Tertiary formations. p. 132-250, illus.

Quaternary formations. p. 251-61, map.

Notes and additions. p. 263-320.

Appendix. On the marls and green sands of the state of Mississippi and their use as a manure. p. 321-27.

Glossary. p. 341-50.

- 1858 HILGARD, E[ugene] W[oldemar]. Report upon the condition of the Geological and Agricultural Survey of the State of Mississippi. Jackson, Miss., Steam Power Press, 1858. 22 p.

- 1860 ————. Report on the geology and agriculture of the state of Mississippi. Jackson, Miss., E. Barksdale, printer, 1860. 24+391 p.

Written Aug. & Sept. 1860.

CONTENTS:

Pt. 1 Geological report. p. 1-201.

Orange sand formation. p. 5-46.

Carboniferous formation. p. 47-60.

Cretaceous formation. p. 47-106.

Tertiary formations. p. 107-93.

Quaternary formations. p. 194-201.

Pt. 2 Agricultural report. p. 202-388.

Appx. B. SPILLMAN, William. Catalogue of Tombigbee green sand fossils. p. 389.

MOORE, W. D. Exploration of the hydraulic limestone district of Tishomingo County. p. 390-91. Written July 20, 1860.

- 1862 ————. Report to Gov. John Peters on the resources of the state of Mississippi for the manufacture of salt. Oxford, Miss. June 9, 1862. 4 p. (In Newspapers).

Paper in Scientific Journal

- 1854 LIEBER, O. M. A sketch of the geology of the state of Mississippi. In Mining Mag. (1853), v. 3, no. 1, p. 41-7, map. July, 1854.

HERNDON & GIBBON'S EXPLORATIONS OF THE VALLEY OF THE AMAZON (1851)

History

On Feb. 15, 1851, the Secretary of the Navy issued instructions for an exploration of the valley of the Amazon River, to Lts. W. L. Herndon and Lardner Gibbon:

"The government desires to be put in possession of certain information relating to the valley of the River Amazon, in which term is included the entire basin, or water-shed, drained by that river and its tributaries . . .

. . . You will make such geographical and scientific observations by the way as may be consistent with the main object of the expedition, always bearing in mind that these are merely incidental . . .

It is desirable that you should bring home with you, specimens or samples of the various articles of produce from the Amazon River, together with such seed or plants as might probably be introduced into this country with advantage . . ."

The explorations of the expedition were carried on during 1851 and 1852. Some collections in natural history were made and observations on the ethnology and physical geography of the regions traversed were given in the Final Report.

Herndon's Report was submitted on January 25, 1853; and Gibbon's on January 25, 1854. The Report was published in two volumes in 1853 and 1854 in both a Senate and a House edition. L. W. Bailey described the microscopical organisms collected.

Report

(1) Senate edition, Serials no. 663 & 664

1853 HERNDON, W[illiam] L[ewis], and GIBBON, Lardner. . . . Exploration of the valley of the Amazon made under the direction of the Navy Department by . . . Washington, 1853-54. 2 v. illus. pl. maps, tab. 4°. (In U. S. 32d Cong., 2d sess., Sen. Ex. Doc. v. 6, no. 36, 2 pts.) Serials no. 663 & 664.

v. 1, Herndon's Report. 414 + 4 p. 16 pl.

v. 2, Gibbon's Report. 11 + 339 p. illus.

(2) House edition, Serials no. 678 & 722

a) Herndon's Report. (In U. S. 32 d Cong., 2 d sess., H. Ex. Doc. v. 5, no. 43.) Serial no. 678.

b) Gibbon's Report. (In U. S. 33 d Cong., 1 st sess., H. Ex. Doc. v. 9, no. 53.) Serial no. 722.

Papers in Society Transactions

1861 BAILEY, L. W. Notes on new species of microscopical organisms chiefly from the Para River, South America.

Rd before Bost. Soc. Nat. Hist. (1830), April 3, 1861. In its Jour. v. 7, p. 329-52. Abstr. in its Proc. v. 8, p. 162-69.

ILLINOIS GEOLOGICAL SURVEY (1851)

History

“The first geological survey of Illinois was created by the General Assembly in 1851. It was placed in charge of a geologist appointed by the governor, auditor and treasurer. The duties of the geologist were, briefly, ‘to ascertain the order, successive arrangement, relative position, dip and comparative magnitude of the several strata or geological formations in the state, and to search for and examine all the beds and deposits of ores, coals, clays, marls, rocks, and such other mineral substances as may present themselves’ . . .

“He was also required to transmit an annual report . . . Provision was also made for the collection of a cabinet of specimens found within the state, from which duplicates were to be distributed to the larger institutions of learning. The act provided for a continuous annual appropriation of \$3,000. This, however, was increased by the next legislature to \$5,000 for general expenses and \$500 per annum for topographic maps of the counties.

“Dr. Joseph Granville Norwood was in charge of the Survey for the first six years after its organization. He began work with an examination of the bluffs of the Ohio River in southern Illinois. In six years about \$27,000 had been expended, but no Report had been submitted. An investigating committee found that the money had been wisely spent, and recommended an additional appropriation for the completion of the Survey. Norwood’s only publication bearing the date of 1857 . . . was devoted to the discussion of Illinois coals. It was accompanied by a one-page colored map of the state.

“In 1858 Norwood turned over to his successor, Dr. Amos Henry Worthen, the field notes of several assistants and a Report on the lead mines of Hardin County. The first Report submitted by Worthen was devoted to two geologic sections, one across the

Silurian and Devonian formations of southern Illinois and the other following the Mississippi River from end to end of the state. This Report however and the others submitted previous to 1865 were never published, owing to the opposition of certain members of the legislature. Indeed, an attempt was made to repeal the law under which the survey was organized, and only the interference of the executive veto saved the organization.

“Worthen re-organized the survey and obtained the services of a number of specialists. J. D. Whitney was authorized to investigate the lead and zinc region of northwestern Illinois and Prof. Leo Lesquereux was engaged ‘to investigate the coal measures and the carboniferous plants.’ The assistance of F. B. Meek in the investigation of invertebrate fossils and of J. S. Newberry in the department of vertebrate paleontology was also secured . . . and the following other scientists shared the work of the first survey: Henry Engelmann, H. A. Prout, Bannister, Freeman, Scudder, Bradley, Green, Shaw, Broadhead, Cox, St. John, Miller, Wachsmuth, Barris, Springer, Ulrich and Cope . . .” From HAYES, p. 42-4. (U. S. Geol. Surv. Bull. no. 465).

With the exception of Engelmann, Prout, Cope, and J. V. Z. Blaney, who was the chemist of the Survey, few of the others did work before 1865 or 1866, in connection with the Survey.

For a critical discussion of the publications of the Geological Survey of Illinois, see also MERRILL, (1) p. 432-33, and 496-98. (See Annot. Bib.). For the documents in the Illinois State Series of Documents, see HASSE, (2), pt. 8, July, 1909, p. 300-6. Those relating to the Survey before 1865 are given in the BIBLIOGRAPHY below. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 300-1, 380-83.

A large number of preliminary papers on the Survey were published before 1865, which will be found below under PAPERS IN SOCIETY TRANSACTIONS AND JOURNALS.

Only the first two volumes published in 1866 of the Worthen Survey are analysed below. For the others, see WHITE, 1890, in BIBLIOGRAPHY below.

According to Merrill (see below BIBLIOGRAPHY: 1920), about \$105,000 was expended on the Survey prior to 1866.

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- 1851 AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Memorial to the legislature of Illinois from the . . . urging the importance of establishing or resuming the Geological Survey. (In ILLINOIS. H. Rept. 17th Gen. Assem. 1851. p. 451-54).

See also AMER. ASSOC. ADV. SC. (1848).

ILLINOIS. STATE LEGISLATURE. Copy of the law passed February 17, 1851, authorizing a geological survey of the state, with amendment to same. (In Geol. Surv. Illinois. v. 1, pref. p. 9-10).

- 1857 ILLINOIS. COMMITTEE. Report of the committee on the Geological Survey of the State, with reports of the state geologist and state topographer and a statement comparing the appropriation made for the Geological Survey of Illinois, with sums appropriated for similar purposes by other states. (In Repts. Gen. Assem. 1857. p. 413-22).

- 1863 ILLINOIS. Veto of bill to improve state library and pay for services rendered in the geological survey of the state. (In H. Jour. 23d Gen. Assem. Reg. sess. 1863. p. 12-3).

- 1865 ———. Recommendation for provision for publication of the results of the Geological Survey. (In Governor's Message. 1865. p. 15).

- 1866 GEOLOGICAL SURVEY OF ILLINOIS, A. H. Worthen, Director. . . . Reports . . . Springfield and Chicago, 1866-90. 9 v. in 8, illus. pl. maps. 4°

v. 1 & 2 are collated and analysed below under Reports (q.v.) See also LINDAHL, below. v. 1 & 2, pub 1866; v. 3, 1868; v. 4, 1870; v. 5, 1873; v. 6, 1875; v. 7, 1883; v. 8, July, 1890 (& separate atlas). Index in v. 8 for all volumes.

- 1890 LINDAHL, Josua. General index to Geological Survey of Illinois, v. 1-8. (In Geol. Surv. Illinois. v. 8, appx. p. 39-151).
WHITE, C[hables] A[biathar] A sketch of the scientific work of Prof. A. H. Worthen. (In Geol. Surv. Illinois. v. 8, appx. p. 18-37).

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- 3 ————, Sub-Carboniferous limestone [series]. p. 77-118.
- 4 ————. Devonian and Silurian systems. p. 119-52.
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Written Oct. 1, 1860. Assisted by J. P. KIMBALL.
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- 9 WORTHEN, A. H. Geology of Randolph Co. p. 278-96.
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NORWOOD, J. G. On Rosiclare lead mines. p. 366-75.
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- 15 ————. Pulaski Co. p. 410-27.

- 16 ———. *Geology of Massac Co., and that part of Pope Co., south of Big Bay River.* p. 428–55.
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LEE'S DOLPHIN EXPEDITION (1851)

History

In 1851, Lt. S. P. Lee was ordered by the Navy Department to conduct a cruise in the U. S. Brig "Dolphin," the object of which was the "testing of new routes and perfecting the discoveries made by Lt. Maury in the course of his investigations of the winds and currents of the ocean." The explorations were continued for three years. Deep sea dredgings were made, and the resulting specimens described by Prof. J. W. Bailey. Lee's Report was rendered in 1854.

Report

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OREGON & WASHINGTON SURVEYS BY EVANS (1851)

History

"In March, 1851, Dr. John Evans was appointed by the Secretary of the Interior, "to institute geological researches on the main lines of the public land surveys about to be commenced in Oregon (Territory—which then included the state of Washington), and entered zealously on that laborious duty, exploring the Falls of the Missouri to the Flat Head Pass in the Rocky Mountains, and through that pass from the forty-sixth to the forty-ninth degrees of north latitude and to the Columbia River."

"The valleys of the Flat Head Lake and Bitter Root Rivers were also explored, and he crossed the Bitter Root range of mountains, which are one hundred and twenty miles wide; explored the country to the Spokane River, the Clear Water, Snake, Walla Walla, Utiilah, John Day's and Falls Rivers, to the Columbia, and thence to Oregon City . . ."

"He collected specimens of all the rocks, minerals, fossils and soils of those wide-spread regions and forwarded them for description and analysis to Drs. D. D. Owen, Litton, Leidy, Shumard, Lesquereux, and the author . . . Dr. Evans worked steadily on his report, presented it to Congress, and having had an opportunity to revisit Oregon and Washington territories, by consent of Congress, withdrew his report for the purpose of adding to it his last researches . . . We understand that this labor was performed and the revised and completed report is now in the General Land Office at Washington, awaiting publication . . ." C. T. JACKSON, in the *Amer. J. Sc.* ser. 2, v. 32, p. 312-13. Nov. 1861.

In the year 1853, the government began its great series of explorations known as the Pacific Railroad Surveys (1853), q.v., and John Evans was appointed geologist to the main party under Gov. I. I. Stevens, working along the 47th and 49th parallels of north latitude. Evans combined his Reports and forwarded them to Washington; but they were unfortunately lost in transit. For a number of papers descriptive of the collections made by him, see *Pacific RR. Surv.* (1853), v. 1, & 12, *Papers in Society Transactions*. Below is a paper by Shumard describing some earlier collections made by Evans.

Benjamin Franklin Shumard acted as assistant to Evans for a short time. See his Obituary of Evans, in *Acad. Sc. St. Louis. Trans.* v. 2, p. 162-64. 1861.

G. P. MERRILL in his *First 100 yrs. Amer. Geol.* 1924. p. 318, footnote, states that the supposedly lost MSS. noted above was recovered in part in 1917 by D. L. Bushnell, Jr., who deposited it in the archives of the Smithsonian Institution.

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SITGREAVES' EXPEDITION DOWN THE ZUNI AND COLORADO RIVERS (1851)

History

In Sept. 1851, Lt. Lorenzo Sitgreaves received the following instructions regarding an expedition down the Zuni and Colorado

Rivers: "The river Zuni is represented on good authority to empty into the Colorado, and it has been partially explored by Lieut. Simpson to the Pueblo of Zuni. You will therefore go to that place, which will be in fact, the commencing point of your labors. From the Pueblo of Zuni, you will pursue the Zuni to its junction with the Colorado, determining its course and character, particularly in reference to its navigable properties, and to the character of its adjacent land and productions. The junction of the Zuni and Colorado will be accurately determined. You will then pursue the Colorado to its junction with the Gulf of California . . ."

The expedition was organized at Santa Fe, and left September 24, 1851. The expedition continued through December of the same year. S. W. Woodhouse accompanied the party in the capacities of surgeon and naturalist. Sitgreaves was also assisted by R. H. Kern and Lt. J. G. Parke. The Final Report was rendered Feb. 7, 1853, and published in the same year.

Woodhouse made the collections and described all but those on fishes, reptiles and botany, which were reported by Messrs. Baird & Girard, Edward Hallowell and John Torrey, respectively.

For details of routes followed, see also WARREN, p. 63-4. For papers by Woodhouse and others published before the Final Report see below PAPERS IN SOCIETY TRANSACTIONS.

Report

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| p. | 31- 40 | WOODHOUSE, S. W. | Report on the natural history of the country passed over by the exploring expedition under . . . Capt. L. Sitgreaves . . . during the year 1851. |
| | | | Covers in part the expeditions by SITGREAVES & WOODRUFF, in U. S. SURV. CREEK BOUNDARY LINE (1849), q.v., and Capt. JOHNSTON'S IN RECONN. ROUTES SAN ANTONIO TO EL PASO (1849), q.v. |
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- 1853 ————— Pouched rat, genus Dipodomys, Ordii, Gray.
 Rd before Phila. Acad. Nat. Sc. (1812), Jan. 11, 1853. In its Proc. v. 6, p. 235-36.
- Description of a new species of mouse, genus Hesperomys, Waterhouse.
 Rd before Phila. Acad. Nat. Sc. (1812), Feb. 1, 1853. In its Proc. v. 6, p. 242.
- BAIRD, S. F., and GIRARD, Charles. Descriptions of some new fishes from the River Zuni.
 Rd before Phila. Acad. Nat. Sc. (1812), Rd June 21, 1853. In its Proc. v. 6, p. 368-69.

SOCIETY FOR THE ADVANCEMENT OF NATURAL
SCIENCES, LOUISVILLE, KY. (1851)*History*

During the winter of the year 1851, a few gentlemen conceived the idea of founding a scientific society, the aim of which should be to make an extensive collection of the fauna and flora of the state, and to lay the foundation of a scientific library. In furtherance of this object, a meeting was held, December 6, 1851, and the society organized. On the 11th of the same month, the following gentlemen were elected officers: Prof. Charles Short, president; Prof. J. Cobb, vice-president; Prof. L. P. Yandell, secretary, and S. A. Casseday, treasurer. Immediately upon this election, a most decided opposition to the Society sprang up, and for some weeks a fierce newspaper war was waged against it. It was denominated "the mutual admiration society" and made the subject of daily ridicule. The cause of this determined opposition was the jealousy existing between the rival medical schools of that period. These rancorous bickerings exhibited a spirit wholly unworthy of gentlemen occupying high positions in the scientific world, and resulted only in directing attention to the society and its operations.

A series of weekly lectures was delivered upon various scientific subjects, embracing chemistry, zoology, entomology, comparative anatomy, geology, etc. Notwithstanding the very disagreeable weather and often almost impassable condition of the streets, it was several times found difficult to seat the numbers who thronged the lecture rooms of the institution. These lectures, continued through two winters were marked by the greatest ability and formed a most attractive feature . . . During the two years of the society's existence, a considerable sum of money was collected, the greater portion of which was expended for cases suitable for the exhibition and conservation of specimens. A fine collection of mastodon bones, fresh water shells, minerals, and fossil corals of the Palaeozoic rocks, was deposited in them, forming the basis of a large and useful cabinet. Unfortunately, the whole of this collection was destroyed during the conflagration of the building of the medical department of the University of Louisville, where they had been temporarily deposited.

The existence of this Society, like that of many of its predecessors, was destined to be short. During the year 1854, several of

the most zealous and influential cultivators of science removed from the city, and the number of members being materially lessened, it was found impossible, notwithstanding the strenuous efforts of the remainder, to keep alive the interest which had thus been created. Had this Society continued its organization, the effect upon the community, in drawing attention to scientific subjects, would have been quite satisfactory. So excellent a commencement might to-day have been in full fruition, and Louisville might have boasted a prominent position in the scientific annals of the country.

But though for a while the desire to compass an organization seemed in lethargy, it was not dead. The votaries of science waited but for a favorable opportunity to renew their efforts. In the fall of 1858 a few enthusiastic students of the sciences met together to determine some permanent basis upon which to erect a society for the acquisition and advancement of scientific knowledge. Although the local history of former institutions presented little encouragement for such an undertaking, yet it was determined to make a commencement. During the month of November, the present officers were elected, and the Society commenced life in earnest: [S. A. Casseday, president; T. E. Jenkins, vice-president; W. N. Hailman, secretary; L. N. Dembitz, treasurer; C. J. Knapp, librarian.]

Aware that former failures were the result of having nothing to keep alive a once awakened interest, rather than of any distaste or other cause, the founders of this Society determined to devote all money not actually required for current expenses, to the purchase of the scientific periodicals of the day . . . The rooms are open every Thursday and Monday evenings . . .

Besides the evenings devoted to reading, there are two evenings of each month on which regular meetings are held, when a paper on some scientific subject is read before the society by some active member . . . Several of these papers have already been published and others are in progress of publication.

No efforts have been made towards a museum of natural history, as the funds are not sufficient to procure suitable rooms or to furnish proper cases for the conservation of specimens . . ." Constitution, p. 3-5. [see below.]

Nothing more can be learned concerning the subsequent history of this organization.

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WISCONSIN STATE AGRICULTURAL SOCIETY (1851)

History

The Wisconsin State Agricultural Society, founded in 1851, published through its Transactions a number of papers on natural history by Messrs. Lapham and Hoy (see below PAPERS ON NATURAL HISTORY).

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- 1855 ——— The forest trees of Wisconsin. T. v. 4, p. 195-251.
 Rev. in Amer. J. Sc. v. 76, p. 139. July, 1858.

ANNALS OF SCIENCE (1852)

History

The ANNALS OF SCIENCE, of which two volumes were published, made its first appearance at Cleveland on October 15, 1852, under the editorship of Hamilton Lanphere Smith. During the first year of its existence it was published on the 1st and 15th of each month; and monthly during its second and last year.

Volume 1 included the Transactions of the American Association For the Advancement of Science (1848), q.v., which held its 1853 meeting at Cleveland. Volume 2 included the Proceedings of the Cleveland Academy of Natural Sciences (1845), q.v. Below are given the PAPERS ON NATURAL HISTORY contained in the two volumes.

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- 1852 ANNALS OF SCIENCE, being a record of inventions and improvements in applied science . . . conducted by H. L. Smith. Cleveland, 1852-54. 2 v.

Papers on Natural History

- 1852 v. 1, no. 1, October 15
 NEWBERRY, J. S. Fossil fishes of the cliff limestone. p. 12-3, illus.
- v. 1, no. 2, November 1
 WHITTLESEY, Charles. The ancient miners of Lake Superior. p. 15-8, 27-30, illus.
 Intended for the postponed (1852) meeting of the Amer. Assoc. Adv. Sc. (1848), q.v.
 BRAINERD, J[ehu]. Fossil fishes. p. 18-20, illus.
 ANON. Circulation of plants. p. 23-4, illus.
- v. 1, no. 3, November 15
 SMITH, H. L. On ciliary movements. p. 31-2, illus.
- v. 1, no. 4, December 1
 ————— Phytozoa. p. 45-6, illus.
 DESOR, E. On the drift of the northern and western states. p. 47-8. (Transl. from Geol. Soc. France. Bull.)
- 1852 v. 1, no. 6, January 1
 WHITTLESEY, Charles. Western Reserve coal field. p. 70-2, sect.
- v. 1, no. 8, February 1
 NEWBERRY, J. S. Fossil plants from the Ohio coal basin. p. 95-7.
- v. 1, no. 9, February 15
 ————— Fossil plants . . . (cont.). p. 106-8.
- v. 1, no. 10, March 1
 ————— New fossil plants from Ohio. p. 116-17, illus.
- v. 1, no. 11, April 1
 BURNETT, W. I. Points in reproduction of small animals. p. 123-24.
 FOSTER, J. W. New species of fossil plants from Ohio. p. 128-29, illus.

v. 1, no. 13, May 1

NEWBERRY, J. S. New species of fossil plants from Ohio. p. 152-53, illus.

WHITTLESEY, Charles. Origin of the bitumen of stratified rocks. p. 153-57.

WETHERILL, C. M. Food of the queen bee. p. 157.

v. 1, no. 14, May 15

ANON. Geological surveys of the west. p. 164.

NEWBERRY, J. S. New fossil plants from Ohio. p. 164-65, illus.

v. 1, no. 15, June 15

SMITH, H. L. Phytozoa. p. 176-77, illus.

1854

v. 2, no. 1, January

———— The microscope and microscopic manipulation. p. 6-7.

v. 2, no. 3, March

———— The microscope . . . (cont.). p. 79-81.

WHITTLESEY, Charles. Drift etchings—Lake Superior. p. 57-9.

v. 2, no. 4, April

HARRIS, T. W. Letter to Dr. Kirtland on *Varessa furellata*. p. 100-1.

v. 2, no. 5, May

SMITH, H. L. The microscope. . . (cont.). p. 132-33.

KANE'S EXPEDITION TO THE ARCTIC REGIONS (1852)

History

On November 27, 1852, Elisha Kent Kane received orders to go "to the highest penetrable point of Baffin's Bay, from which we were to search for the missing vessels of Sir John Franklin. The party sailed from New York on May 30, 1853, in the brig "Advance" and attained the highest northern position up to that time, in latitude 78° 43' N. Kane's explorations were continued through 1854 and 1855. He had previously been a member of the U. S. Grinnell Expedition in search of Sir John Franklin, 1850-1852.

He rendered brief official reports in 1855, and published popular accounts in 1854 and 1856 (see Bibliography, below). Although not strictly a scientific expedition, Kane made some collections, chiefly botanical, which were described by Elias Durand (see below (PAPERS IN SOCIETY TRANSACTIONS)).

Bibliography

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Rev. in North Amer. Rev. v. 80, p. 307-42. Apr. 1855. First printing dated 1853.
- 1856 ———. Arctic explorations in the years 1853, '54, '55. Phila. Childs & Peterson, 1856. 2 v. illus. pl. port. maps.
Rev. in North Amer. Rev. v. 84, p. 95-122. Jan. 1857.
v. 2, p. 442-67, appx. no. 18. DURAND, Elias. Enumeration of plants collected in his first and second expeditions to the Polar regions, with descriptions and remarks.
Repr. below (see PAPERS IN SOC. TRANS.: 1856)
- 1860 HAYES, Isaac I[srael]. An Arctic boat journey in the autumn of 1854. . . . Bost. Brown & Taggart, 1860. 17+375 p. map.
Another ed., 1867. 25+387 p.
- 1884 NOURSE, J[oseph] E[verett]. American explorations in the ice zones: the expeditions of De Haven, Kane, Rodgers, Hayes, Hall, Schwatka . . . prepared chiefly from the official sources. . . . Boston, Lothrop, 1884. 578 p. illus.
ch. 3, p. 65-107, deal with Kane's Expeditions.

Report

- (1), Senate ed., Serial no. 812.
- 1855 KANE, Elisha Kent. Report to the Secretary of the Navy, Dec. 3, 1855. (In U. S. 34th Cong., 1st sess., Sen. Ex. Doc., v. 3, no. 1, p. 52-68) Serial no. 812.
- (2), House ed., Serial no. 842.
- . Same. . . . Washington, 1855. (In U. S. 34th Cong., 1st sess., H. Ex. Doc. v. 1, pt. 3, no. 1, p. 52-68) Serial no. 842.

Papers in Society Transactions

- 1852 JUSTICE, G. M. . . . The *Protococcus nivalis* brought by Dr. Kane from the Arctic Regions . . . and a microscopical description of the plant.
Rd before Amer. Phil. Soc. (1769), Apr. 2, 1852. In its Proc. v. 5, p. 262.
- KANE, E. K. A number of specimens of vegetable matter found by him on the ice-plains of the Polar Seas.
Rd before Amer. Phil. Soc. (1769), May 7, 1852. In its Proc. v. 5, p. 266-67.

- 1856 DURAND, Elias. . . . The collection of plants brought from the Arctic Regions by the Expedition under the command of Dr. Kane.

Rd before Amer. Phil. Soc. (1769), Apr. 18, 1856. In its Proc. v. 6, p. 186-87.

————— Plantae Kaneanae Groenlandicae: enumeration of plants collected by Dr. E. K. Kane, in his first and second expeditions to the Polar Regions, with descriptive remarks.

Rd before Phila. Acad. Nat. Sc. (1812), May 6, 1856. In its Jour. ser. 2, v. 3, pt. 3, p. 179-204. Nov. 1856.

MARCY'S EXPLORATION OF THE RED RIVER (1852)

History

Orders dated March 5, 1852, ordered Captains R. B. Marcy and G. B. McClellan to explore the Red River of Louisiana. Dr. G. G. Shumard was the surgeon and naturalist of the expedition. McClellan acted as the chief assistant. The party left Fort Belknap, on May 2, and returned to Fort Arbuckle, on July 28, 1852.

Natural history collections were made and submitted to Messrs. Shepard, Edward Hitchcock, B. F. Shumard, S. F. Baird, Charles Girard, C. B. Adams, John Torrey and W. W. Turner.

Marcy's Report was rendered December 5, 1852, and the publication of same occurred in 1853.

For details of the routes followed, see also WARREN, p. 64, (see Annot. Bib. v. 1).

For critical notes on the geology contained in the Report, see also MERRILL, (1), p. 434-35. (See Annot. Bib.). See also his First 100 yrs. Amer. Geol. 1924. p. 303-4.

Bibliography

- 1898 COVILLE, F. V. Three editions of Marcy's "Report on the Red River of Louisiana." (In Torrey Bot. Club. Bull. v. 25, p. 155-57. March, 1898)

The three editions examined at N. Y. Public Library.

Report

(1) Armstrong ed., Serial no. 666

- 1853 MARCY, Randolph B[arnes], and MCCLELLAN, George B[rinton]. . . . Exploration of the Red River of Louisiana in the year 1852, by Randolph B. Marcy, assisted by George B. McClellan; with reports on the natural history of the country . . .

Washington, Robert Armstrong, 1853. 15+320+12 p. 66 pl. illus. 2 maps. (In U. S. 32d Cong., 2d sess., Sen. Ex. Doc. v. 8, no. 54). Serial no. 666

Report rendered Dec. 5, 1852.

Rev. in Amer. J. Sc. v. 69 (ser. 2, v. 19), p. 437-38. May, 1855.

This edition is the only one to be found in the Serial set.

(2) Tucker ed. Not in Serial Set.

1854 ————. Same . . . Washington, B. Tucker, 1854. 15+310 p. illus. 66 pl. 2 maps. (U. S. Engineer Bureau).

In U. S. 33rd Cong., 1st sess. Sen. Ex. Doc. unnumbered.

A reprint of the preceding with the TUCKER imprint, and dated 1854.

(3) Nicholson ed. Not in Serial Set.

———. Same . . . Washington, A. O. P. Nicholson, 1854.

15+286 p. illus. 66 pl. 2 maps. (U. S. Engineer Bureau).

In U. S. 33rd Cong., 1st sess., H. Ex. Doc. unnumbered.

CONTENTS:

(In Serial Set, Serial no. 666)

- p. 1-152 MARCY, R. B. Narrative of the expedition.
appx. A., p. 119-37 Meteorological observations.
appx. B., p. 139-52 Table of courses and distances.
- p. 153-304 Natural History Reports (In Appendixes)
- p. 153- 59 SHEPARD, C. U. Report on the minerals collected.
June 1, 1853. Appx. C.
- p. 163- 78 HITCHCOCK, Edward. Notes upon the specimens of
rocks and minerals collected. June 5, 1853. Appx. D.
- p. 179- 95 SHUMARD, G. G. Remarks upon the general geology
of the country passed over by the Exploring Expedition. . . Appx. D. 10 sect.
- p. 197-211 SHUMARD, B. F. Paleontology: Description of the
species of Carboniferous and Cretaceous fossils collected. Appx. E. 6 pl.
- p. 215- 16 MARCY, R. B. Mammals. Appx. F.
- p. 217- 44 BAIRD, S. F., and GIRARD, Charles. Reptiles. Appx.
F. 11 pl.
- p. 245- 52 ———— Fishes. Appx. F. 3 pl.
- p. 253- 56 ADAMS, C. B. Shells. . . Dec. 1, 1852. Appx. F.
- p. 257- 61 GIRARD, Charles. Orthopterous insects. Appx. F. 1 pl.
- p. 262- 71 ———— Arachnidians. Appx. F., 2 pl. 18 fig.
- p. 272- 75 ———— Myriapods. Appx. F.
- p. 277-304 TORREY, John. Botany: Description of the plants
collected during the expedition. Appx. G. 20 pl. 79
fig. Written Aug. 10, 1853.
- p. 305- 11 MARCY, R. B., and TURNER, W. W. Ethnology.
- p. 313- 20 Index.

- 1853 BAIRD, S. F., and GIRARD, Charles. Description of new species of fishes collected by Captains R. B. Marcy and G. B. McClellan in Arkansas. Rd before Phila. Acad. Nat. Sc. (1812), Aug. 16, 1853. In its Proc. v. 6, p. 390-92.

NATIONAL BOTANIC GARDEN, WASHINGTON (1852)

History

Attempts to found a National Botanic Garden were made by the Columbian Institute for the Promotion of Arts & Sciences (1816), q.v., as early as 1822. Both then and in 1829, unsuccessful efforts were made to persuade Congress to appropriate the necessary amounts. In the forties, the National Institution for the Promotion of Science (1840), q.v., revived the proposition for a Botanic Garden, but with no success.

With the return of the great Wilkes United States Exploring Expedition (1838), q.v., in 1842, a vast amount of botanical material was placed at the disposal of the government for safe and adequate preservation. The collections were kept temporarily in greenhouses near the Patent Office, which then housed all the Exploring Expedition material.

In 1852, the NATIONAL BOTANIC GARDEN as such was organized by moving the botanical collections to the present site of the Botanical Garden, west of the Capitol, on the southern side of Pennsylvania Avenue. The collections were at this period under the care of W. D. Brackenridge, the horticulturist of the Expedition under Wilkes.

Bibliography

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- 1917 RATHBUN, Richard. The Columbian Institute for the Promotion of Arts and Sciences: a Washington Society of 1816-1838, which established a Museum and a Botanic Garden under government patronage. Wash. Gov't print. office, 1917. 3+87 p. (In U. S. Nat. Mus. Bull. no. 101).

PERRY'S U. S. JAPAN EXPEDITION (1852)

History

In 1852, Commodore M. C. Perry conducted his famous expedition for the purpose of opening commercial relations with Japan.

The expedition continued through 1854. The results and narrative of the journey were published in 1856 in three volumes.

"With reference to the following papers upon the respective branches of natural history of which they particularly treat, it should be borne in mind that in the equipment of the Japan Expedition, scientific researches were to be considered of secondary importance, and consequently no special appropriations were made or any steps taken at the outset to employ civilians, as in other expeditions, for purposes purely scientific . . . Mr. William Heine contributed chiefly to the procurement of the birds. The Collections of fishes and shells were made under my own supervision, and the botanical specimens gathered and preserved by the chief interpreter, Mr. S. W. Williams and Doctors Green, Fahs and Morrow." PERRY. v. 2, p. 213.

In addition to the above named, Perry was assisted by Rev. George Jones, G. R. West, Junius J. Boyle, Joel Abbot, Bayard Taylor. Reports on the collections made were submitted by John Cassin, J. C. Jay, Asa Gray, J. C. Brevoort, Francis Boott, D. C. Eaton, W. H. Harvey, W. S. Sullivant.

The Final Report was published in both a House and a Senate edition. Contents of volumes are given below.

Report

(1) Senate ed., Serials no. 769, 770, 771.

- 1856 PERRY, M[atthew] C[albraith], and HAWKS, Francis L[ister]. . . . Narrative of the expedition of an American squadron to the China seas and Japan performed in the years 1852, 1853 and 1854, under the command of Commodore M. C. Perry, United States Navy, by order of the government of the United States, compiled from the original notes and journals of Commodore Perry—his officers, at his request, and under his supervision by Francis L. Hawks. Washington, 1856. 3 v. illus. pl. maps. charts, tab. diagr. 4°. (In U. S. 33d Congress., 2d sess., Sen. Ex. Doc. v. 14, no. 79, 3 parts). Serials no. 769, 770, 771.

(2) House ed., Serials no. 802, 803, 804.

———. Same . . . Washington, 1856. 3 v. illus. pl. maps, charts, tab. diagr. (In U. S. 33d Cong., 2d sess., H. Ex. Doc. v. 12, no. 97, 3 parts). Serials no. 802, 803, 804.

v. 1, Narrative by F. L. Hawks. 18 + 537 p. illus. pl.

v. 2, Papers on natural history, agriculture, etc. 414 + 20 + 13 p. illus. pl. maps.

- v. 3, Zodiacal light, by Rev. George Jones. 43 + 705 p.
 v. 1 rev. in North Amer. Rev. v. 82, p. 559-62. Apr. 1856.
 v. 2 rev. in North Amer. Rev. v. 83, p. 233-60. July, 1856.

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- v. 1, Serial no. 769 or 802
 HAWKS, F. L. Narrative of the Expedition. 18 + 537 p. illus. pl.
 v. 2, Serial no. 770 or 803
- p. 1- 11 GREEN, D. S. Report on the agriculture of Madeira.
 Cape of Good Hope, Mauritius, etc.
- p. 13- 20 MORROW, J. Report on the agriculture of Lew Chew.
- p. 21- 37 GREEN, D. S. Report on the medical topography and
 agriculture of the Island of Great Lew Chew.
- p. 39- 50 FAHS, C. F. Report made to Commodore Perry on
 the botany, ethnography, etc., of the Island of Great
 Lew Chew. Written Feb. 5, 1854.
- p. 51- 6 JONES, George. Report . . . of a geological explora-
 ration of the Island of Lew Chew. . . Feb. 6, 1854.
- p. 57- 63 ————— Report . . . of an exploration of Great
 Lew Chew. May 9, 1854.
- p. 65- 71 TAYLOB, Bayard. Report . . . upon the exploration
 of Peel Island. June 18, 1853.
- p. 73- 8 FAHS, C. F. Report . . . of an exploration of Peel
 Island. June 18, 1853.
- p. 79- 88 GREEN, D. S. Report upon the agriculture of Japan.
- p. 89- 93 ————— Report upon medical topography of
 Japan.
- p. 94- 8 JONES, George. Report respecting a mineral spring
 near Hakodadi on the Island of Jesso, Japan.
- p. 99-107 GREEN, D. S. Report upon agriculture of China.
- p. 109- 13 WEST, G. R. Paper upon agriculture of China.
- p. 115- 19 BOYLE, J. J. Report of examination of Volcano Bay.
- p. 121- 33 ABBOT, Joel, and others. Reports.
- p. 135- 49 PERRY, M. C., and others. Instructions and reports
 in relation to a visit to Manila and Formosa by the
 Japan Expedition.
- p. 151- 63 JONES, George. Reports . . . of a visit to the coal
 regions of the Island of Formosa. July 22 & 28, 1854.
- p. 165- 70 BACHE, B. F. Report of a comparative analysis of
 Cumberland, Formosa, and Japan coal.
- p. 171-210 PERRY, M. C., and others. Reports on commercial
 relations with Far East.
- p. 211- 13 PERRY, M. C. Introductory note to natural history
 papers.
- p. 215- 48 CASSIN, John. Birds. 6 col. pl.
 (a) Birds collected in Japan. p. 219-35.
 (b) Birds collected in China, the Loo Choo Islands
 . . . Singapore. Ceylon and on the coast of Cali-
 fornia. p. 236-48.

- p. 253- 88 BREVOORT, J. C. Note on some figures of Japanese fish taken from the recent specimens by the artists of the U. S. Japan Expedition. 12 col. pl.
- p. 289- 97 JAY, J. C. Report on the shells collected . . . together with a list of Japan shells. 5 pl. [42 fig.]
- p. 301- 22 GRAY, Asa. Account of the botanical specimens.
- p. 322- 29 BOOTH, Francis. Carices.
- p. 329- 30 EATON, D. C. Filices.
- p. 330. SULLIVANT, W. S. Musci and Hepaticae.
- p. 331- 32 *HARVEY, W. H. Algae.

CALIFORNIA ACADEMY OF NATURAL SCIENCES (1853)

History

"The first meeting at which the organization of an Academy of Sciences in California was considered was held in San Francisco on April 4, 1853, at the office of Lewis W. Sloat, at what was then no. 129 on the west side of Montgomery Street . . . Seven gentlemen interested in science were present, viz.: Dr. Andrew Randall, Dr. Henry Gibbons, Dr. Albert Kellogg, Col. Thomas J. Nevins, Dr. John B. Trask, Dr. Charles Farris and Lewis W. Sloat. After a 'free conversation and an interchange of views and sentiments' it was decided to organize under the name of the "THE CALIFORNIA ACADEMY OF NATURAL SCIENCES."

"On April 11, a draft of a constitution was presented, which, after discussion, was recommended for correction and engrossment . . . On April 18, by-laws were presented . . . On Monday, May 16, the proposed constitution and by-laws and the name were formally adopted. On May 23, officers were elected as follows: President, Andrew Randall; vice-president, Henry Gibbons . . . On June 27, the Academy was legally incorporated. . . . At a meeting of January 13, 1868, the Constitution was slightly amended . . . and the name changed to that of the "California Academy of Sciences." CALIFORNIA ACAD. SC. Constitution. p. 3-4. 1915.

The Proceedings of the Academy were first printed in a newspaper of the day entitled: "The Pacific," in 1854. Between 1854 and 1865, three volumes were published. The first, 1854-57 was republished in 1873, as the 2d edition of v. 1.

The chief contributors to the Proceedings from 1854 to 1866 were W. O. Ayres, Albert Kellogg, J. B. Trask, Henry and W. P.

Gibbons, H. Behr, J. G. Cooper, H. N. Bolander, W. M. Gabb, W. P. Blake, Wesley Newcomb.

The Academy early began the formation of a museum, and a scientific library. J. B. Trask and J. D. Whitney, members of the Academy, were the state geologists between 1853 and 1865.

Its officers between 1853 and 1865 were, president: 1854-55, Andrew Randall; 1856-65, Leander Ransom; vice-presidents: Theodore Moss, A. Kellogg; curators at various periods: W. O. Ayres (zoology), T. L. Andrews (botany), W. P. Gibbons (geology), L. Lanszweert (zoology), L. W. Sloat (conchology), H. G. Bloomer (botany), J. B. Trask (geology), H. Behr (entomology), H. G. Hanks (mineralogy), J. A. Veatch (conchology).

Below, under PAPERS ON NATURAL HISTORY, are given in chronological order by date reading, the papers published in the Proceedings between 1854 and 1866.

Bibliography

- 1854 CALIFORNIA ACADEMY OF NATURAL SCIENCES. Proceedings . . . of the . . . 1854-date. San Francisco, 1854-date. illus, pl.

The dates of publication of the various parts of v. 1-3, are given below under PROCEEDINGS (P): Dates of publication.

- 1915 CALIFORNIA ACADEMY OF SCIENCES. Constitution and by-laws of . . . San Francisco, 1915. 52 p.

Proceedings (P)

Dates of Publication

v. 1, for Sept. 4, 1854-June 29, 1857, pub. 1854-57.

2d ed, pub. Dec. 31, 1873. 125 p. 6 pl. (Double columns)

pt. 1, for 1854-55, p. 1-83.

pt. 2, for 1856-57, p. 84-125.

v. 2, for Feb. 22, 1858-Dec. 15, 1862, 1858-1863, 236 p. 73 illus.

p. 1-124, for 1858-1861, pub. 1858-61.

p. 125- 40, pub. Dec. 1861.

p. 141- 56, Apr. 1862.

p. 157- 72, Sept.

p. 173- 88, Dec.

p. 189-236, Jan. 1863.

v. 3, for 1863-1867, pub. 1863-68. 411 p.

p. 1- 16 pub. Apr. 1863

p. 17- 32 May

p. 33- 64 Sept.

p. 65- 80 Nov.

p. 81- 96	Dec.
p. 97-112	Jan. 1864
p. 113- 28	Mar.
p. 129- 60	July
p. 161- 76	Dec.
p. 177- 92	Jan. 1865
p. 193-208	Feb.
p. 209- 48	Feb. 1866
p. 241- 56	May
p. 257- 72	Aug.
p. 273-312	Jan 1867
p. 313- 60	Sept.
p. 361-411	May, 1868

Papers on Natural History

- 1854 GIBBONS, W. P. Description of four new species of viviparous fishes from Sacramento River and San Francisco Bay. Rd May 15.

Also rd before Phila. Acad. Nat. Sc. (1812), June 13, 1854. In its Proc. v. 7, p. 105-6.

———— Description of a new species of viviparous marine and fresh water fishes, from the San Francisco Bay, and from the river and lagoons of Sacramento. Rd May 15, 22, & 29.

Also rd before Phila. Acad. Nat. Sc. (1812), July 4, 1854. In its Proc. v. 7, p. 122-26.

AYRES, W. O. On *Labrus pulcher*, A. P. v. 1, p. 3-4. Rd Sept. 4.

———— . . . On *Sebastes nebulosus* and *S. paucispinis*. P. v. 1, p. 5-6. Rd Sept. 11.

———— On *Sebastes ruper*; A.; *Centrarchus maculosus*, A. P. v. 1, p. 7-8. Rd Sept. 18.

———— On *Morrhua Californica*, A.; and *Grystes lineatus*, A. P. v. 1, p. 8-10. Rd Oct. 2.

———— On *Clypeocottus robustus*, A. P. v. 1, p. 10-1. Rd Oct. 9.

———— On *Brosenius marginatus*, A.; *Syngnathus griseo-lineatus*, A. P. v. 1, p. 12-3. Rd Oct. 23.

KELLOGG, A. On *Lavatera assurgentiflora*, K. P. v. 1, p. 13-4. Rd Oct. 23.

AYRES, W. O. Descriptions of the sturgeons . . . found in our waters. P. v. 1, p. 14-6. Rd Oct. 30.

———— On *Osmerus elongatus*, A., and *Mustelus felus*, A. P. v. 1, p. 16-7. Rd Dec. 4.

BEHR, H. *Cuscuta Ceanothi*. P. v. 1, p. 16. Rd Dec. 4.

AYRES, W. O. *Catostomus accidentalis*, A.; *Gila grandis*, A. P. v. 1, p. 17-8. Rd Dec. 11.

———— On two Cyprinoid fish, *Lavinia gibbosa*, and *L. compressa*, A. P. v. 1, p. 19-20. Rd Dec. 18.

- Description of *Gila microlepidota*, A. P. v. 1, p. 20-1.
Rd Dec. 25.
- 1855 ————— On *Liparis pulchellus*, A.; and *L. mucosus*, A. P. v. 1,
p. 22. Rd Jan. 8.
- WINSLOW, C. F. Fragment of a jaw of an extinct elephant in the drift
of Texas. . . P. v. 1, p. 23. Rd Jan. 8.
- KELLOGG, A. *Quercus Ransomi*. P. v. 1, p. 23-4. Rd Jan. 15.
- AYRES, W. O. On *Leiostomus lineatus*, A., and *Leptogunnellus, gracilis*,
A. P. v. 1, p. 24-5. Rd Jan. 22.
- KELLOGG, A. On a *Linariad* considered new. P. v. 1, p. 25-6. Rd
Jan. 29.
- AYRES, W. O. On *Petromyzon plumbeus*, A. P. v. 1, p. 27. Rd Feb. 5.
- TRASK, J. B. On three specimens of *Naiades*, with descriptions, from
the Sacramento River and lagoons. P. v. 1, p. 27-8. Rd Feb. 12.
- GIBBONS, Henry. On the Redwood and Mammoth trees . . . P. v. 1,
p. 28. Rd Feb. 12.
- TRASK, J. B. On a new species of *Alasmodon*, from the Yuba River.
P. v. 1, p. 29. Rd Feb. 19.
- AYRES, W. O. On *Anarrhichthys ocellatus*, A. P. v. 1, p. 30-1. Rd
Feb. 26.
- . . . On *Catostomus labiatus*, A. P. v. 1, p. 31-2. Rd
Mar. 5.
- KELLOGG, A. On *Arabis blepharophylla*. P. v. 1. p. 32. Rd Mar. 12.
- AYRES, W. O. On *Mylopharodon robustus*, A. P. v. 1, p. 32-4. Rd
Mar. 12.
- ANTISELL, Thomas. . . On fossils derived from San Luis Obispo
County. P. v. 1, p. 34-5. Rd Mar. 12.
- GIBBONS, W. P. On *Salmo iridia*, G. P. v. 1, p. 35-6. Rd Mar. 19.
- AYRES, W. O. On a specimen of a canine foetus of full term, exhibiting
a singular instance of abnormal formation resulting from the union of
two ova, one developing of course in part at the expense of the other.
P. v. 1, p. 36. Rd Mar. 19.
- KELLOGG, A. On the California *elecampane*, *Melarrhiza*, K.; and *Marsh*
muricatus. P. v. 1, p. 36-8. Rd Mar. 26.
- TRASK, J. B. On *Ammonites Batesii*, T. P. v. 1, p. 39. Rd April 2.
- AYRES, W. O. On *Platessa bilineata*, A. P. v. 1, p. 39-40. Rd April 2.
- TRASK, J. B. Descriptions of fossil shells from the Tertiary deposits
of the lower coast. P. v. 1, p. 40-2. Rd April 9.
- AYRES, W. O. On *Salmo rivularis*, A., and *Petromyzon ciliatus*, A. P.
v. 1, p. 43-4. Rd April 16.
- K[ELLOGG, A.] On *Fritillaria alba* and *F. multiscapidea*, K. P. v.
1, p. 45-6. Rd April 23.

AYRES, W. O. On *Gasterosteus serratatus*, A., supposed to be new. P. v. 1, p. 46-7. Rd April 30.

GIBBONS, W. P. On *Ctenorhinus setimanus*, G. P. v. 1, p. 47-8. Rd April 30.

AYRES, W. O. On *Scalops Californicus*, A. P. v. 1, p. 52-3. Rd May 21.

KELLOGG, A. On four species of *Ceanothus*, or tea-tree. P. v. 1, p. 53-4. Rd May 21.

AYRES, W. O. On *Apodichthys vivescens*, A. P. v. 1, p. 54-5. Rd May 21.

KELLOGG, A. On *Viola Montana* and *V. purpurea*, K. P. v. 1, p. 55-6. Rd May 28.

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AYRES, W. O. On *Cebidichthys crista-galli*, A. P. v. 1, p. 58-9. Rd June 4.

KELLOGG, A. On *Mimulus atropurpurea*? P. v. 1, p. 59-60. Rd June 11.

———. On *Azalea nudiflora*, var. *ciliata*, etc. P. v. 1, p. 61. Rd June 18.

BEHR, H. On *Chloropyron mihi*. P. v. 1, p. 62. Rd June 25.

DAVIS, Horace. Geological specimens. P. v. 1, p. 62. Rd. June 25.

KELLOGG, A. On *Polygala cornuta*, etc. P. v. 1, p. 62-4. Rd July 2.

AYRES, W. O. On *Caranx symmetricus*, A. P. v. 1, p. 64. Rd July 2.

———. On *Merlangus productus*, A. P. v. 1, p. 65-6. Rd July 16.

KELLOGG, A. On *Malvastrum splendidum*, K. . . . P. v. 1, p. 67-8. Rd July 23.

AYRES, W. O. On *Saurus lucioiceps*, A. P. v. 1, p. 69-70. Rd Aug. 6.

———. On the Echinodermata of the coast of California. P. v. 1, p. 71-2. Rd Aug. 20.

BEHR, H. Description of *Oxybaphus Froebelli*. P. v. 1, p. 72. Rd Aug. 27.

AYRES, W. O. On *Torpedo California*, A. P. v. 1, p. 74-5. Rd Sept. 10.

———. On *Notorhynchus maculatus*, A. P. v. 1, p. 76-7. Rd Oct. 8.

———. On *Calycilepidotus*. P. v. 1, p. 81-2. Rd Dec. 24.

1856 TRASK, J. B. On earthquakes in California, from 1812 to 1855. P. v. 1, p. 85-8. Rd Jan. 14.

Also in Amer. J. Sc. (1818), v. 72, p. 110-16. July, 1856.

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———. Description of three new species of the genus *Plagiostoma*, from the Cretaceous rocks of Los Angeles. P. v. 1, p. 93-4, illus. Rd Mar. 17.

STIMPSON, William. On some Californian Crustacea. P. v. 1, p. 95-9. Rd April 28.

AYRES, W. O. On *Scomber* Diego, A. P. v. 1, p. 101-2. Rd Oct. 20.

1857 TRASK, J. B. On the earthquakes during 1856. P. v. 1, p. 102-4. Rd Jan. 12.

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BLAKE, W. P. Note on the occurrence of telluret of silver in California. P. v. 1, p. 107-8. Rd Feb. 23.

TRASK, J. B. On some new microscopic organisms. P. v. 1, p. 110-12. Rd Mar. 30.

———. Nine new species of *Zoophytes* from the Bay of San Francisco and locality. P. v. 1, p. 112-15. Rd Mar. 30.

KELLOGG, A., and BEARDSLEY, F. A. On *Cupressus fragans*, K.; or the fragrant cypress. P. v. 1, p. 115-16. Rd Oct. 5.

VEATCH, J. A. Notes of a visit to the "Mud volcanoes" in the Colorado desert, in the month of July, 1857. P. v. 1, p. 116-21. Rd Dec. 7.

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1858 TRASK, J. B. Earthquakes in California during the year 1857. P. v. 1, p. 121-22. Rd Jan. 11.

KELLOGG, A. Descriptions of new species of plants. P. v. 2, p. 4-6, 8-14. Rd July 26 et seq.

1859 ———. New genera and species of plants found by Dr. J. A. Veatch, at Ceros Island. P. v. 2, p. 15-20, 21-2. 22-5. Rd Sept. 26, Oct. 2 and 10.

AYRES, W. O. On new fishes of this coast. P. v. 2, p. 25-32. Rd Oct. 17.

KELLOGG, A. Description of a very remarkable species of *Oenothera*, brought from Ceros Island by Dr. J. A. Veatch. P. v. 2, p. 32-3. Rd Oct. 24.

———. Plants from Ceros Island by J. A. Veatch. P. v. 2, p. 33-7. Rd Nov. 14 and Dec. 2.

1860 ———. On a new genus of plants *Liliorhiza*. P. v. 2, p. 46-8, illus.

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AYRES, W. O. Descriptions of new fishes. P. v. 2, p. 52-64. illus. Rd July 2 et seq.

- KELLOGG, A. Descriptions of new plants. P. v. 2, p. 64-72, illus. Rd Sept. 3.
- AYRES, W. O. On new species of fishes. P. v. 2, p. 73-86. Rd Oct. 1 et seq.
- 1861 KELLOGG, A. Description of a species of *Polypodium* found in the vicinity of San Francisco, springing from the crevices of rocks. P. v. 2, p. 88-91, illus. Rd Jan. 21.
- NEWCOMB, [Wesley]. Descriptions of new species of shells. P. v. 2, p. 91-4, 103-4. Rd Feb. 4 and Mar. 18.
- KELLOGG, A. Descriptions of new plants. P. v. 2, p. 94-102, 104-18, illus. Rd Feb. 18 et seq.
- COOPER, J. G. New Californian animals. P. v. 2, p. 118-23. Rd July 7.
- KELLOGG, A. New species of plants. P. v. 2, p. 123-27, 142-55, 158, illus. Rd July 21 et seq.
- PUMPELLY, R. Mineralogical sketch of the silver mines of Arizona. P. v. 2, p. 127-39. Rd Aug. 5.
- AYRES, W. O. Description of a new ichthyic form from the coast of Lower California. P. v. 2, p. 156-58, illus. Rd Dec. 1.
- 1862 KELLOGG, A. Descriptions of new species of plants. P. v. 2, p. 163-65, illus. Rd Feb. 3 et seq.
- See also p. 161-62.
- GABB, W. M. Description of two new species of *Pennatulidae* from the Pacific coast of the U. S. P. v. 2, p. 166-67. Rd Mar. 3.
- BEHR, H. On certain butterflies of California. P. v. 2, p. 167-69. Rd Mar. 17.
- GABB, W. M. Descriptions of two new species of *Cephalopodes* in the Museum of the . . . Academy . . . P. v. 2, p. 170-72. Rd April 7.
- BEHR, H. On Californian *Argynnides*. P. v. 2, p. 172-77. Rd April 21.
- BOLANDER, H. N. On the grasses in the Academy's herbarium. P. v. 2, p. 177-78.
- . Descriptions of plants. P. v. 2, p. 179-82, illus. Rd June 2.
- KELLOGG, A. Descriptions of new species of plants. P. v. 2, p. 182-98, illus. Rd Aug. 4 et seq.
- BLAKE, W. P. On the great trees of Mariposa and other localities in California. P. v. 2, p. 199-201. Rd Nov. 3.
- COOPER, J. G. On some new genera and species of California *Mollusca* collected by him. P. v. 2, p. 202-7. Rd Nov. 3.
- AYRES, W. O. On new species of fishes. P. v. 2, p. 207-18, illus. Rd Nov. 3.

WHITNEY, J. D. Which is the highest mountain in the U. S. and which in North America? P. v. 2, p. 219-24. Rd Dec. 15.

KELLOGG, A. Descriptions of new plants. P. v. 2, p. 224-32, illus. Rd Dec. 15.

1863 BOLANDER, H. N. Description of new species of *Melica* [stricta]. P. v. 3, p. 4-5. Rd Jan. 19.

KELLOGG, A. Description of two new species of plants from Nevada Territory. P. v. 3, p. 9-10, illus. Rd Feb. 16.

Aplopappus Cass., & *Mirabilis*, Cal.

REMOND, Auguste. Description of two new species of bivalve shells, from the Tertiaries of Contra Costa County. P. v. 3, p. 13. Rd Mar. 2.
Cardium Gabbii & *Ostrea bourgeoisii*.

———. Description of two species of *Scutella*. P. v. 3, p. 13-5. Rd Mar. 2.

AYRES, W. O. Remarks in relation to the genus *Notorhynchus*. P. v. 3, p. 15. Rd Mar. 2.

WHITNEY, J. D. Account of a collection of Japanese minerals and fossils in the possession of J. H. Van Reed. P. v. 3, p. 15-6. Rd Mar. 2.

KELLOGG, A. Description of two new species of *Collomia* from Nevada Territory. P. v. 3, p. 17-9, illus. Rd Mar. 16.

———. Description of a new genus and species of plant from Nevada Territory. P. v. 3, p. 20-1, illus. Rd April 5.

Pterostephanus K.

COOPER, J. G. On a new Californian Mollusc, *Gundlachia Californica*. P. v. 3, p. 21-2, illus. Rd April 20.

*BLAKE, James. Infusoria from the moving sands in the neighborhood of San Francisco. P. v. 3, p. 35-6. Rd May 4.

KELLOGG, A. Description of two new species of plants. P. v. 3, p. 36-7, illus. Rd May 4.

Conyza salicena & *Collinsia divaricata*, K.

———. Description of a new species of *Hosackia* [argentea]. P. v. 3, p. 38-40, illus. Rd June 1.

———. Description of a new species of *Mentzelia* [pectinata]. P. v. 3, p. 40-1, illus. Rd June 15.

———. Description of three new plants. P. v. 3, p. 42-4, illus. Rd July 6.

Linum trisepalum, K.; *L. decurrens*; *Silene Dorrii*, K.

*BLAKE, James. On the gradual elevation of the land in the environs of San Francisco. P. v. 3, p. 45-6. Rd July 6.

REMOND, Auguste. Description of four new species of Echinodermata, from the Tertiaries of Contra Costa County. P. v. 3, p. 52-4. Rd Aug. 3.

KELLOGG, A. Description of new species of *Allium* [parvum]. P. v. 3, p. 54, illus. Rd Aug. 3.

- COOPER, J. G. On new or rare Mollusca inhabiting the coast of California; no. 2. P. v. 3, p. 56-60, illus. Rd Aug. 17.
- KELLOGG, A. Description of a new species of *Alsine* [palustre]. P. v. 3, p. 61. Rd Aug. 17.
- COOPER, J. G. On a new genus of terrestrial Mollusca inhabiting California. P. v. 3, p. 62-3, illus. Rd Sept. 7.
- GARRETT, Andrew. Descriptions of new fishes. P. v. 3, p. 63-6. Rd Sept. 7.
- COOPER, J. G. On new genera and species of California fishes; no. 1 and 2. P. v. 3, p. 70-7, 93-7. Rd Nov. 2 and 16.
- BOLANDER, H. N. Enumeration of shrubs and trees growing in the vicinity of the mouth of San Francisco Bay. P. v. 3, p. 78-83. Rd Nov. 16.
- BEHR, H. On Californian Lepidoptera. P. v. 3, p. 84-93. Rd Nov. 16.
- 1864 GRAY, Asa. Descriptions of new Californian plants, no. 1. P. v. 3, p. 101-3. Rd Jan. 4.
- GARRETT, Andrew. Descriptions of new species of fishes; no. 2. P. v. 3, p. 103-7. Rd Jan. 4.
- COOPER, J. G. On new genera and species of California fishes; no. 3. P. v. 3, p. 108-14, illus. Rd Jan. 4.
- NEWCOMB, W[esley]. Descriptions of nine new species of *Helix* inhabiting California. P. v. 3, p. 115-19. Rd Jan. 18.
- GABB, W. M. Description of a new species of *Virgularia* from the coast of California. P. v. 3, p. 120. Rd Feb. 1.
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- NEWCOMB, W[esley]. Description of a new species of *Pedicularia*. P. v. 3, p. 121-22. Rd Feb. 1.
- BEHR, H. On Californian Lepidoptera, no. 4. P. v. 3, p. 123-27. Rd Mar. 7.
- TRASK, J. B. Earthquakes in California during the year 1863. P. v. 3, p. 127-28. Rd Mar. 7.
- . Earthquakes in California from 1800 to 1864. P. v. 3, p. 130-53. Rd April 18.
- GABB, W. M. On Cretaceous fossils from Sahuaripa Valley, state of Sonora, Mexico, discovered by August Remond. P. v. 3, p. 153-54. Rd May 2.
- *CARPENTER, P. P. Descriptions of new marine shells from the coast of California, pt. 1. P. v. 3, p. 155-59. Rd July 11.
- BEHR, H. Notes on Californian *Satyrides*. P. v. 3, p. 163-66. Rd Sept. 5.

BLAKE, W. P. 1) Note on the fossil remains of the horse and elephant, mingled, at Mare Island, San Francisco Bay; 2) Ammonites or Ceratites from Oregon Bar, middle fork of the American River. P. v. 3, p. 166-167. Rd Sept. 5.

MOORE, G. E. On Brushite, a new mineral occurring in phosphate guano. P. v. 3, p. 167-68. Rd Sept. 5.

Also in Amer. J. Sc. (1818), v. 89, p. 43-4. Jan. 1865.

BLAKE, W. P. Note on the discovery of fossils in the auriferous slate formation of the Mariposa estate, California, and the probable geological age. P. v. 3, p. 170. Rd Oct. 3.

GABB, W. M. 1) Notes on some fossils from the gold bearing slates of Mariposa, with description of some new species; 2) . . . On the San Luis Obispo quicksilver fossils. P. v. 3, p. 172-73; 173-74. Rd Nov. 21.

DANA, J. D. On the crystallization of Brushite. P. v. 3, p. 174-75, illus. Rd Nov. 21.

See also Amer. J. Sc. (1818), v. 89 (ser. 2, v. 39), p. 45-6. Jan. 1865.

*CARPENTER, P. P. On new Californian marine shells; no. 2. P. v. 3, p. 175-77. Rd Nov. 21.

1865 BEHR, H. On Californian Lepidoptera. P. v. 3, p. 178-79. Rd Jan. 9.

NEWCOMB, W[esley]. Description of new species of land shells. P. v. 3, p. 179-82. Rd Jan. 9.

GABB, W. M. Description of new species of marine shells from the coast of California. P. v. 3, p. 182-90. Rd Jan. 9.

TRASK, J. B. Earthquakes in California during 1864. P. v. 3, p. 190-92. Rd Jan. 9.

BLAKE, W. P. 1) New mineral oil regions in the Tulare valley; 2) Note upon the occurrence of sphene in the granite of the Sierra Nevada. P. v. 3, p. 193. Rd Feb. 6.

PREISS, Edward. Euphorbia prostrata as a remedy for the bite of venomous animals. P. v. 3, p. 195-96. Rd Mar. 20.

PEASE, W. H. On the existence of an atoll near the west coast of America and proof of its elevation. P. v. 3, p. 199-201. Rd June 19.

JACKSON, C. T. Big trees of Calaveras County. P. v. 3, p. 204-5. Rd Aug. 7.

CROFT, C. J. The grasses of Arizona. P. v. 3, p. 205-6. Rd Aug. 21.

BLAKE, W. P. Note on the abundance of iron ore in northern Arizona. P. v. 3, p. 206-7. Rd Sept. 4.

*CARPENTER, P. P. Descriptions of new marine shells from the coast of California; no. 3. P. v. 3, p. 207-24. Rd Sept. 11.

BOLANDER, H. N. Remarks on California trees. P. v. 3, p. 225-33. Rd Oct. 16.

CALIFORNIA GEOLOGICAL SURVEYS (1853)

History

The first Geological Survey of California was carried out in a small way under the direction of Dr. John B. Trask, who was requested in March, 1853, to furnish information concerning the geology of the state. Upon submission of his Report on April 6, 1853, he was requested on May 6, 1853, to continue his researches further, under authority from the California legislature.

He submitted reports in 1854 and 1855 on the geology of the Sierra Nevada and the Coast Mountains, and in 1856, on the geology of northern and southern California. The legislature appropriated, according to MERRILL, p. 29 (see Bibliography, below: 1920), \$7,000 during the life of the survey under J. B. Trask.

"The Act of the legislature creating the office of State geologist and authorizing a geological survey of the state of California was approved April 21, 1860; but operations were not commenced until about the first of December of that year . . ."

"The plan of the Survey, according to the requirements of the Act by which it was originally organized, demanded:

'With the aid of such assistants as he may appoint, to make an accurate and complete geological survey of the state and to furnish in his report of the same proper maps and diagrams thereof with a full and scientific description of its rocks, fossils, soils, and minerals, and of its botanical and geological productions, together with specimens of the same, which specimens shall be properly labelled and deposited in such place as shall be hereafter provided for that purpose by the legislature.'

"Under this Act, the Survey was carried on, with greater or less vigor, according to the varying amounts appropriated by each successive legislature until the spring of the present year (1864), when the act expired by constitutional limitation; the legislature of California having no power to create an office which shall last over four years."

"By an act of the last legislature, however, approved April 4, 1864, the office of the state geologist was again created and filled by the same person who thus far held it . . ." J. D. WHITNEY. 1864. (Palaeontology of Cal.) & 1865, (Report of progress).

Prof. Josiah D. Whitney was appointed state geologist at a salary of \$6,000 annually (subsequently, in 1864, raised to \$9,000), with W. H. Brewer, William Ashburner and Chester Averill as assistants. Other assistants engaged up to 1866, were C. H. Hoffmann, topographer, and J. G. Cooper, zoologist, in 1861; August Remond and W. V. Wackenreuden as topographer, in 1862; Clarence King and James T. Gardiner as volunteers in 1863. Specimens were described by F. B. Meek, J. S. Newberry, Joseph Leidy, Theodore Gill, A. M. Edwards and P. P. Carpenter.

Whitney delivered several lectures before the legislature and rendered several brief preliminary annual reports. Only two quarto volumes of the contemplated series of final reports were published before 1866. Others based on the work from 1860 on, were published in 1869, 1870, 1876.

Palaeontology was described by F. B. Meek and W. M. Gabb; Birds, by J. G. Cooper, edited and enlarged by S. F. Baird, from Cooper's notes; (collections made 1860-63, by Cooper, assisted by Edward Palmer); Botany by Brewer, Asa Gray and Sereno Watson.

For a list of the documents in the California set of state documents concerning the Geological Surveys, see HASSE, (2), pt. 7, California. Dec. 1908, p. 214-15.

For a review of the geology contained in the reports see MERRILL, (1), 435-37, 515-17 and his work noted in the Bibliography: 1920, below (q.v.).

For brief history see also HAYES, 1911, p. 20-1; and the several entries noted in the Bibliography below, the most comprehensive being that, by MERRILL: 1920. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 303-7, 407-11.

The expenditures of the State Surveys from their origin in 1853 to the close of 1865 were \$116,600.

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- 1864 MEEK, F[ielding] B[radford], and GABB, W[illiam] M[ore]. . . . Palaeontology . . . Phila. Pub. by order of the Legislature, 1864. 20+243+63 p. 32 pl. [288 fig.] 4°. (Cal. Geol. Surv. Pal. v. 1).

Preface dated Sept. 1864.

CONTENTS:

pref. p. 7-20	WHITNEY, J. D. History of the survey.
p. 3- 16, sect. 1	MEEK, F. B. Description of the Carboniferous fossils.
p. 19- 35, sect. 2	GABB, W. M. Descriptions of the Triassic fossils of California and the adjacent territories.
p. 39- 53,	MEEK, F. B. Descriptions of the Jurassic fossils.
p. 57-217,	GABB, W. M. Description of the Cretaceous fossils.
p. 219- 36,	Index of localities of the Cretaceous.
p. 237- 43,	Alphabetical index of genera and species described.

- 1865 WHITNEY, J[osiah] D[wight]. . . . Geology . . . report of progress and synopsis of the field-work, from 1860 to 1865. Phila. 1865. 27+498 p. illus. pl. (Cal. Geol. Surv. v. 1).

Preface dated Nov. 1, 1865.

CONTENTS:

pref. p. 9-27	WHITNEY, J. D. History of the survey.
pt. 1, p. 1-197	———. Geology of the coast ranges.
pt. 2, p. 199-474	———. Geology of the Sierra Nevada.

- appx. A, p. 475-76 ASHBURNER, William. Tabular statement of the principal quartz mills . . . in 1861.
- appx. B, p. 477-83 MEEK, F. B. Descriptions of fossils from the auriferous slates of California. 1 pl. [6 fig.] p. 485-98 Index.
- 1866 ———. Letter of the state geologist relative to the progress of the state geological survey during the years 1864-65. Sacramento, 1866. 14 p.
In Cal. Journ. 15th sess., v. 1, Doc. no. 10.
- 1869 GABB, William More. . . . Palaeontology . . . v. 2: Cretaceous and Tertiary fossils. Phila. 1869. 14+299 p. 36 pl. 4°. (Cal. Geol. Surv. Pal. v. 2)
pref. p. 7-14 WHITNEY, J. D. Preface.
p. 1-299 GABB, W. M. Palaeontology.
- 1870 BAIRD, S[pencer] F[ullerton], and COOPER, J[ames] G[raham]. . . . Ornithology; v. 1: Land birds; edited by S. F. Baird, from the manuscript and notes of J. G. Cooper. Phila. 1870. 11+592 p. illus.
Collections made by Cooper, assisted by Edward Palmer, between 1860 and 1863.
See also Mus. Comp. Zool. Harvard Univ. Mem. v. 12.
- 1876 BREWER, W[illiam] H[enry]; WATSON, Sereno, and GRAY, Asa. . . . Botany . . . Cambridge, Mass., 1876-80. 2 v. 4°. v. 1, 20+628 p. 1876.
v. 2, 15+559 p. 1880.
Collections were made during 1860-64. Brewer left California in 1864.
v. 2, p. 553-59 BREWER, W. H. List of persons who have made botanical collections in California.

Papers in Society Transactions

- 1854 TRASK, J. B. Mineral district of California.
In Mining Mag. (1853), v. 3, p. 121-36, 239-50. 1854.
- 1855 ———. Mines and mining in California.
In Mining Mag. (1853), v. 5, p. 193-215. Sept. 1855.
- 1863 WHITNEY, J. D. Progress of the state geological survey.
Rd before Cal. Acad. Nat. Sc. (1853), May 4, 1863. In its Proc. v. 3, p. 23-9.
- 1864 ———. Progress of the Geological Survey of California.
In Amer. J. Sc. (1818), v. 87 (ser. 2, v. 37), p. 256-64, 298. Mar. & May, 1864.

GILL, Theodore. Description of a new generic type of Pleuronectoids in the collection of the Geological Survey of California.

Rd before Phila. Acad. Nat. Sc. (1812), Sept. 20, 1864. In its Proc. v. 16, p. 198-99.

- 1865 WHITNEY, J. D. Notice of the explorations of the Geological Survey of California, in the Sierra Nevada, during the summer of 1864.

In Amer. J. Sc. (1818), v. 89, (ser. 2, v. 39), p. 10-3. Jan. 1865.
GRAY, Asa. Characters of some new plants of California and Nevada, chiefly from the collections of Prof. W. H. Brewer, botanist of the State Geological Survey of California, and of Dr. C. L. Anderson, with revisions of certain groups.

Rd before Amer. Acad. A. & Sc. (1780), May 30, 1865. In its Proc. v. 6, p. 519-56.

ELLIOTT SOCIETY OF NATURAL HISTORY, CHARLESTON, S. C. (1853)

History

"This Society, recently formed in this city, is so called in compliment to a distinguished naturalist and scholar, the late Stephen Elliott of Charleston . . .

"The objects of the Society may be gathered from the following introduction to their By-Laws:

'The advancement of useful knowledge is undoubtedly the leading spirit of the age, and as the principle of association is one of power, success, utility, Societies have been formed in most of the large cities of the civilized world for this object, and their efforts have been crowned with the most flattering success . . .

'Among the pioneers for the advancement of science and literature, and especially of natural history in North America, the most prominent were Charlestonians . . . the names of Garden, Elliott, Ramsay, Grimke and others . . . and have thereby become the common property of the world.'

"Influenced by these considerations, and with a view not only to the improvement of ourselves, but also to unite our feeble in-

dividual efforts, more effectually to extend the knowledge we may acquire thereby, we whose signatures are hereunto affixed, do pledge ourselves individually to follow the following rules and regulations for the government of an association hereby formed, for the developing the natural history of our country, and especially of our own state, and for cultivating and promoting the study of science." From CHARLESTON MED. JOUR. v. 8, p. 860-61. Nov. 1853.

The officers at the founding of the Society in 1853, were Dr. John Bachman, president; L. R. Gibbes, E. Geddings, S. H. Dickson, James Moultrie, Wm. Hume, and Edmund Ravenel, vice-presidents; F. S. Holmes, secretary; S. W. Barker, T. L. Burden, J. P. Chazal, L. A. Frampton, P. C. Gaillard, J. F. M. Geddings, John McCrady, W. Wragg Smith, Robert Hume, G. E. Manigault, St. Julien Ravenel, H. W. Ravenel, F. P. Porcher, M. Michel, Francis T. Miles, curators.

In June, 1853, L. R. Gibbes was elected president, and served continuously to 1889, with the exception of 1857-58, when James Moultrie was presiding officer. J. E. Holbrook joined the Society in Nov., 1853.

In December, 1859, the Society received \$500 from the state legislature. The meetings of the Society were interrupted by the outbreak of the Civil War, from Dec. 15, 1860, to Feb. 14, 1866. The collections, papers and much of the other property belonging to the Society were destroyed by the army under Gen. Sherman. Sixteen members of the Society lost their lives in the war (See Proc. v. 2, p. 59).

The first volume of the Proceedings of the Society covering the years 1853-58 was published in 1859; the first volume of the Journal, in three numbers, was published in 1859-60, the further publication of which was prevented by the Civil War. The second volume of the Proceedings appeared at intervals between 1859 and 1890 under the newly adopted name of the Society, the ELLIOTT SOCIETY OF SCIENCE AND ART. (See Bibliography below).

For dates of publication of various parts, see PROCEEDINGS (P), and JOURNAL (J): Dates of publication, below. For a list of the papers read before the Society arranged in chronological order by date of reading, see below PAPERS ON NATURAL HISTORY.

Bibliography

- 1857 ELLIOTT SOCIETY OF NATURAL HISTORY. Constitution and by-laws . . . February, 1857. Charleston, S. C. 1857. 30 p. p. 25-30, List of specimens presented through the Elliott Society to the Museum of the College of Charleston. See Charleston Mus. (1773).
- 1859 ELLIOTT SOCIETY OF NATURAL HISTORY. . . . Proceedings . . . of the . . . of Charleston, S. C. Charleston, S. C., Russell & Jones; N. Y., H. Bailliere, 1859. (v. 1). 4+294+7 p. 14 pl.
Covers period Nov. 1853-Dec. 1858.
- Journal . . . Charleston, S. C., 1859-60. 1 v. (3 nos), [115 p.]. 4°.
- 1890 ELLIOTT SOCIETY OF SCIENCE AND ART. . . . Proceedings of the. . . of Charleston, S. C. . . . v. 2. Charleston, S. C., 1890 (1870-90). 248 p.
Covers Proceedings for period Feb. 1, 1859-Nov. 1890. but first signature appears to have been pub. in 1870. See below PROCEEDINGS: Dates of publication.

Proceedings (P)

- v. 1, for Nov. 11, 1853-Dec. 1858, pub. 1859.
- v. 2, for Feb. 1, 1859-Nov. 1890, pub. 1870-90.
(p. 1-46, deal with period 1859-65.)
- | | |
|---------------|--------------------|
| p. 1- 8, 9-16 | pub. July 6, 1870. |
| p. 17-24 | " July , 1885. |
| p. 25-32 | " Aug. |
| p. 33-40 | " Sept. |
| p. 41- 8 | " Oct. |

Journal (J)

- v. 1, art. 1, 1859, p. 1- 42, see W. W. Smith, 1857, below.
art. 2, 1859, p. 43-100, see W. H. Ford, 1858, below.
art. 3, 1860, p. 101- 15, see John McCrady, 1860, below.

Papers on Natural History

- 1853 AGASSIZ, Louis. Letter . . . [from . . . on fossil shark of the Tertiary of S. C.] P. v. 1, p. 2. Rd Nov. 1.
- 1854 GIBBES, L. R. Description, with figures, of six species of Porcellana, inhabiting the eastern coast of North America. P. v. 1, p. 6-13, illus. Rd Jan. 18.

HOLMES, F. S. Descriptions of new fossil Balani from the Eocene marl of Ashley River, S. C. P. v. 1, p. 21, illus. Rd June 6. (Ordered pub. Mar. 6, 1855.)

GIBBES, L. R. Monograph of the genus *Cryptopodia*. P. v. 1, p. 32-9, illus. Rd June 6.

- 1855 HOLMES, F. S. Description of a new species of *Ostrea* found living in the waters of the coast of South Carolina. P. v. 1, p. 29. Rd June 6.
O. triangularis.

LEE, J. "On the red, or rather yellow locust." P. v. 1, p. 23-4, 50. Rd July 24

- 1856 HOLMES, F. S. Contributions to the natural history of the American devil-fish, with descriptions of a new genus from the harbour of Charleston, South Carolina. P. v. 1, p. 39-46. Rd June 11.

RAVENEL, H. W. Notice of some new and rare phaenogamous plants found in this state. P. v. 1, p. 50-4. Rd Nov. 14.

MCCRADY, John. Description of *Oceania* (*Turritopsis*) *nutricula* nov. spec. and the embryological history of a singular Medusan larva found in the cavity of its bell. P. v. 1, p. 55-90, 7 pl. [42 fig.] Rd Dec. 1.

GIBBES, L. R. On some points which have been overlooked in the past and present conditions of Niagara Falls. P. v. 1, p. 91-100, sect. Rd Dec. 15.

- 1857 MCCRADY, John. *Gymnophthalmata* of Charleston harbor. P. v. 1, p. 103-221, 5 pl. [45 fig.] Rd April 15.

See also P. v. 2, p. 7.

———. On the history of specific form. P. v. 1, p. 222-23. Rd May 15.

———. Observations on the embryology of *Bolina* from Charleston Harbor. P. v. 1, p. 223-24. Rd June 1.

SMITH, W. W. Flora of the low country of South Carolina reviewed. J. v. 1, art. 1, 41 pl. Rd July 1, Aug. 1, and Dec. 1.

Not pub. until 1859.

GIBBES, L. R. Description of *Ranilia muricata* Milne Edwards. P. v. 1, p. 225-36, 1 pl. Rd July 15.

MCCRADY, John. On the development of two species of *Ctenophora* found in Charleston Harbor. P. v. 1, p. 254-71, 1 pl. [14 fig.] Rd Aug. 1.

FRAMPTON, L. A. On an *Orthoceras* from Minnesota. P. v. 1, p. 237-38. Rd Aug. 15.

MCCRADY, John. On the Medusae found at Bay Point Island, at the mouth of Port Royal Harbor, S. C. P. v. 1, p. 239-40. Rd Sept. 1.

GIBBES, L. R. Botany of Edings' Bay. P. v. 1, p. 241-48. Rd Oct. 15.

- 1858 ———. On the representatives of the genus *Cactus* in this state. P. v. 1, p. 272-73. Rd Jan. 15.

MCCRADY, John. Instance of incomplete longitudinal fission in *Actinia cavernosa*, Bosc. P. v 1, p 275-78, illus. Rd Feb. 15.

———. On the Eocene formation in the neighborhood of Alligator, Fla. P. v. 1, p. 282-83. Rd May 1.

RAVENEL, E[dmund]. Description of three new species of Univalves recent and fossil. P. v. 1, p. 280-82. Rd May 1.

FORD, W. H. Normal presence of alcohol in the blood. J. v. 1, art. 2, 57 p. (p. 43-100). Rd May 15.

Not pub until 1859.

GIBBES, L. R. Notice of the phenomena attending the shock of the earthquake of Dec. 19, 1857. P. v. 1, p. 288-89. Rd Sept. 1.

1859 MCCRADY, John. On the earthquake shock felt in Charleston, Dec. 19, 1857. P. v. 2, p. 1-2. Rd Feb. 1.

———. Some remarks on *Liriopsis scutigera*. P. v. 2, p. 6. Rd June 15.

GIBBES, L. R. . . . Remarks on a journey in Virginia from Richmond to the Springs P. v. 2, p. 7-8. Rd July 15.

MCCRADY, John. Remarks on the caves near Clarkesville, Tennessee. P. v. 2, p. 10-2, illus. Rd Nov. 15.

1860 SMITH, W. W. Autumn coloring, fall of the leaf, and winter habits of trees and shrubs in the lower country of South Carolina. P. v. 2, p. 14-9. Rd Feb. 1.

MCCRADY, John. On the leech. P. v. 2, p. 21. Rd April 2.

———. On a new species of *Cheirocephalus*, found in a pond on Charleston Neck. P. v. 2, p. 22-3. Rd April 16.

RAVENEL, Edmund. On *Hirudo*? P. v. 2, p. 24. Rd May 1.

GEDDINGS, J. F. M. On a specimen of *Ophiosaurus ventralis*. P. v. 2, p. 27. Rd Aug. 15.

MCCRADY, John. The law of development by specialization: a sketch of its probable universality. J. v. 1, art. 3, 15 p. (p. 101-15.) Rd Oct 1.

“The publication of this paper is interrupted by the political crisis in America, but will be resumed as soon as practicable.”
Note, p. (15). Dec. 14, 1860.

RAVENEL, Edmund. The limestone springs of St. John's, Berkeley, and their probable availability for increasing the quantity of fresh water in Cooper River. P. v. 2, p. 28-32. Rd Oct. 15.

PORCHER, F. P. On the similarity of the flora of Powhatan County, Virginia, with that of Fairfield District, S. C. P. v. 2, p. 28. Rd. Oct. 15.

Records destroyed by Gen. Sherman's Army.

FORSTER, A. M. Rice culture in South Carolina. P v. 2, p. 40-6. Rd. Oct. 15.

RAVENEL, Edmund. Tellinidae of South Carolina. P. v. 2, p. 33-40. Rd Dec. 15.

JOHNSON, Benjamin. List of addenda to the Botany of Edings' Bay, S. C. P. v. 2, p. 46. Rd Dec. 15.

GIBBES, L. R. Rules for the accentuation of names in natural history, with examples zoological and botanical . . . Charleston, S. C., Russell & Jones, 1860. 13 p.

Preface dated Jan. 15, 1857.

FLINT SCIENTIFIC INSTITUTE, FLINT, MICH. (1853)

History

The Flint Scientific Institute at Flint, Michigan, was organized early in 1853 and incorporated Feb. 3, 1853. Its chief object was the study and pursuit of the natural sciences, with especial emphasis on natural history.

The officers elected were D. Clarke, president; F. H. Rankin, secretary; Manly Miles, librarian. The most active members during the period of organization, were in addition to the above named: R. S. Hutton, C. L. Avery, William Stevenson, A. B. Pratt and S. E. Wilcox.

The Institute had a very active career up to the outbreak of the Civil War. Large natural history collections were assembled and a special building rented to house them. Numerous lectures on natural history matters were given annually. An excellent account of these activities may be found in the article by ELLIS (see Bibliography, below). Miles served in 1859-60 as assistant in zoology to Prof. Alex. Winchell in his Survey of the state of Michigan.

Bibliography

1857 FLINT SCIENTIFIC INSTITUTE. Constitution . . . Flint, Mich., F. H. Rankin, printer, 1857. 16 p.

Copy examined at Library of Congress.

1879 ELLIS, Franklin. The Flint Scientific Institute. (In his History of Genesee County, Michigan. Phila. 1879. p. 148-51).

FLORIDA GEOLOGICAL SURVEY (1853)

History

" . . . In 1853 the General Assembly of Florida passed an act establishing the office of state engineer and geologist. The geologic

part of the work, however, seems not to have been provided for. The first report of the state engineer and geologist [F. L. Dancy] comprises p. 19-36 of 'Documents accompanying the message of the governor of Florida' submitted November 28, 1854. That part of the Report relating to geology occurs on page 20 of the Appendix and reads as follows:

'On the subject of the geology of the state, I have made no report, from the fact that the General Assembly failed to specify any appropriations to defray any expenses incurred in reference to the matter. Consequently nothing has been done by me, except to obtain specimens of soils and minerals from the various localities (where marked changes were perceptible) visited by me in the performance of duties as engineer.'

The office of state engineer and state geologist was abolished by an act of the legislature of 1855." SELLARDS, E. H., p. 62 (see Bibliography, 1908, below) and HAYES, 1911, p. 34-5. (U. S. Geol. Surv. Bull. no. 465).

Bibliography

- 1908 SELLARDS, E[lias] H[oward]. Geological investigations in Florida previous to the organization of the present Geological Survey. Tallahassee, 1908. (In Florida Geol. Surv. 1st Ann. Rept. 1907-8. p. 54-72).
- . Bibliography of Florida geology. Tallahassee, 1908. (In Florida Geo. Surv. 1st Ann. Rept. p. 73-108).
212 entries arranged alphabetically by authors.
- 1920 MERRILL, G[eorge] P[erkins], ed. Florida Geological Surveys. Washington, 1920. (In U. S. Nat. Mus. Bull. no. 109. p. 53-5).

ILLINOIS STATE AGRICULTURAL SOCIETY (1853)

History

The Illinois State Agricultural Society was organized on January 5, 1853. Although not especially devoted to natural history subjects, a number of natural history papers were published in its Transactions.

Its Transactions also served for a time as the medium of publication for the papers read before the Illinois Natural History Society, Bloomington (1858), q.v.

Below is given a list of the papers read before the Agricultural Society, but not including those read before the Natural History Society, which will be found under that Society itself.

Bibliography

- 1855 ILLINOIS STATE AGRICULTURAL SOCIETY. Transactions of the . . . Springfield, Illinois, 1855-date. v. 1-date.

Transactions (T)

- v. 1, for 1853-55, pub. 1855
 2, " 1856-57, " 1857
 3, " 1858-59, " 1859
 4, " 1859-60, " 1861
 5, " 1861-64, " 1865
 6, " 1865-66, " 1868

Papers on Natural History

- 1855 ROE, E. R. Origin and character of our prairie soils. T. v. 1, p. 507-9.
 HOY, P. R. The seventeen year cicada. T. v. 1, p. 510-13.
 LE BARON, William. Observations upon some of the birds of Illinois most interesting to the agriculturist. T. v. 1, p. 559-65.
 Written Dec. 1854.
 KENNICOTT, Robert. Catalogue of animals observed in Cook County, Illinois. T. v. 1, p. 577-95.
 PRATTEN, Henry. Catalogue of the birds of Illinois. T. v. 1, p. 596-609.
 ULFFERS, H. A. Mollusca of southern Illinois. T. v. 1, p. 610-12.
 1857 LAPHAM, I. A. Catalogue of the plants of the state of Illinois. T. v. 2, p. 492-550.
 ———. The native, naturalized and cultivated grasses of the state of Illinois. T. v. 2, p. 551-613, 4 pl. [42 fig.]
 KENNICOTT, Robert. The quadrupeds of Illinois, injurious and beneficial to the farmer. T. v. 2, p. 615-84, 10 pl.
 From Patent Office Report for 1856, p. 52-110, pl. 5-15. Cont. in Report for 1857, p. 72-107, 1 pl. & for, 1858, p. 241-56.
 1859 BRENDAL, Frederick. Additions and annotations to Mr. Lapham's catalogue of Illinois plants. T. v. 3, p. 583-85.
 BEBB, M. S. List of plants occurring in the northern counties of the state of Illinois, in addition to the catalogue given by Dr. I. A. Lapham. T. v. 3, p. 586-87.
 BRENDAL, Frederick. The trees and shrubs in Illinois. T. v. 3, p. 588-604.
 Cont. in T. v. 4, p. 404-13, 10 pl. 1861.

———. The oaks of Illinois. T. v. 3, p. 605-9, 12 pl.

1862 THOMAS, Cyrus. Insects injurious to vegetation in Illinois. T. v. 5, p. 401-68.

WORTHEN, A. H. Familiar letters on geology. T. v. 5, p. 624-43.

MINING MAGAZINE (1853)

History

The MINING MAGAZINE, devoted primarily to mines and allied subjects, made its first appearance in July, 1853. It was edited and conducted by William J. Tenney, assisted part of the time by August Partz, and Stephen P. Leeds. It contained a large number of geological reports of private mines, etc., excerpts from state geological reports, and reprints of articles from the AMERICAN JOURNAL OF SCIENCE (1818), and other scientific publications. It appeared monthly; two issues were sometimes combined in one.

Upon the completion of the ninth volume, it was taken over and conducted by Thomas McElrath, the first number under his supervision appearing in January, 1858. Only two volumes were published under the title: MINING AND STATISTIC MAGAZINE.

With the appearance of v. 11, no. 1, July, 1858, the name was changed to MINING MAGAZINE & JOURNAL OF GEOLOGY, MINERALOGY, etc., under the editorship of W. P. Blake. After two volumes were issued, it suspended publication.

Bibliography

(A) v. 1-9.

1853 (THE) MINING MAGAZINE; devoted to mines, mining operations, metallurgy, etc.; edited and conducted by William J. Tenney. New York, 1853-57. 9 v. illus. pl. plans.

v. 2, TENNEY aided by August PARTZ; v. 3, by PARTZ & S. P. LEEDS; v. 4, by LEEDS.

v. 1, no. 1, July, 1853; v. 9, no. 6, Dec. 1857.

Continued under the title:

(B) v. 10-11.

1858 (THE) MINING AND STATISTIC MAGAZINE; devoted to mines, mining operations, metallurgy, etc.; edited and conducted by Thomas McElrath. New York, Jan.-Dec. 1858. 2 v. illus. pl. plans.

Continued under the title:

(C) (v. 12-13).

- 1859 (THE) MINING MAGAZINE AND JOURNAL OF GEOLOGY, MINERALOGY, METALLURGY, CHEMISTRY AND THE ARTS, in their applications to mining and working useful ores and metals; edited by William P. Blake. New York & New Haven, 1859-61. 2 v. illus. pl. plans.

Being the continuation of the MINING AND STATISTIC MAGAZINE, from ser. 2, v. 1, no. 1, Nov. 1859-July, 1860.

Papers on Natural History

- 1853 v. 1, no. 1, July, p. 1-98

TRASK, J. B. Geology of the Sierra Nevada, or California range. art. 2, p. 6-23.

See also CALIFORNIA GEOL. SURV. (1853.)

ANON. The mines and mineral resources of America. art. 3, p. 23-7. Cont. in next no., below.

HODGE, J. T. Report on the mining properties of the Shelburne Lead Mining Compny, at Shelburne, N. H. art. 4, p. 27-34.

v. 1, no. 2, August, p. 99-216

ANON. The mines and mineral resources of America. art. 2, p. 109-13. Cont. from preceding no., (q.v.); Also cont. in next no., below.

WHITNEY, J. D. Mineral tract of the East Tennessee and Cherokee Mining Company. art. 3, p. 114-21, illus.

ANON. Quartz mining operations in California. art. 7, p. 144-50.

v. 1, no. 3, September, p. 217-330

SILLIMAN, Benjamin, Jr. Report on the Manassas Mining property. art. 2, p. 228-31.

ANON. The mines and mineral resources of America. art. 3, p. 232-35. Cont. from preceding no.; & cont. in following no.

JACKSON, C. T. Shelburne lead mines. art. 5, p. 245-50.

SILLIMAN, Benjamin, Sr. Particulars relative to the lead-mine near Northampton, Mass. art. 7, p. 256-61.

Repr. from AMER. MINER. JOUR. (1810), v. 1, no. 2, art. 12, p. 63-9. (Jan. 1811?)

- 1853 v. 1, no. 4, October, p. 331-446

ANON. The mines and mineral resources of America. art. 2, p. 347-51. Cont. from preceding no., (q.v.)

JOHNSON, W. R. The coal lands of the Deep River Mining Company in North Carolina, with analyses of the minerals. art. 3, p. 352-65.

ROGERS, H. D. Report on the Wheatley and Brookdale mines, Chester Co., Pa. art. 6, p. 375-87.

v. 1, no. 5, November, p. 447-558

TENNEY, W. J. The silver of the Lake Superior mineral region. art. 1, p. 447-54.

HODGE, J. T. Report of the Lycoming Iron and Coal Company. . . . July 6, 1853. art. 2, p. 455-68.

ANON. The property of the Short Mountain Coal Company situated in Lykens Valley, Pa. art. 3, p. 468-76.

JACKSON, C. T. Report on the Dolly Hide copper mine. art. 4, p. 476-80.

RICHARDSON, C. S. Views on American mines and minerals. art. 7, p. 489-96.

v. 1, no. 6, December, p. 559-672 + 4 p.

HITCHCOCK, Edward. The coal fields of Bristol County, and of Rhode Island. art. 3, p. 582-91.

Rept. made to Mass. Legislature, Feb. 23, 1853. See also MASS. GEOL. SURV. (1830). Repr. in Amer. J. Sc. (1818), v. 66 (ser. 2, v. 16), p. 327-36. Nov. 1853.

SHEPARD, C. U. Report on the Sumner, Hipp, Fulwood and Lemons mines of North Carolina. art. 4, p. 591-97.

Originally pub. in 1835, separately.

1854

v. 2, no. 1, p. 1-118, January

RICHARDSON, C. S. Northampton district: the Loudville mine. Art. 2, p. 13-20, illus.

WADDINGTON, Alfred. Lodes and quartz veins of gold. art. 3, p. 21-4.

JACKSON, C. T. Moore's gold mines, Dahlonega, Ga. art. 4, p. 24-7.

LEEDS, S. P. Notes on the gold regions of North and South Carolina, taken during a four months' residence. art. 5, p. 27-34.

v. 2, no. 2, February, p. 119-236

RICHARDSON, C. S. The cobalt and nickel mines in Chatham, Conn. art. 2, p. 124-28.

PHILLIPS, J. V. The geology of the Upper Mississippi lead region. art. 3, p. 129-38, illus.

HODGE, J. T. The Ulster lead mines. . . . art. 4, p. 138-49, illus.

v. 2, no. 3, March, p. 237-354

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*RIVOT, E. Visit to Lake Superior. . . . art. 4, p. 249-55.

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Transl. from *Annales des Mines*. v. 7, p. 329-50. 1855.

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Cont. in next no. Extract from Rept. v. 1, of IOWA GEOL. SURV. (1855), q.v.

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LESQUEREUX, Leo. On the formation of coal. art. 2, p. 264-84.

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art. 2, p. 419-27.

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57, map.

———. Report upon the Hendricks gold lots, Lumpkin Co., Ga.
art. 7, p. 457-61, map.

———. Report upon the property of the Valley River Gold
Company. art. 8, p. 461-66, map.

MISSOURI GEOLOGICAL SURVEY (1853)

History

"On the 12th day of April last (by virtue of an act approved
Feb. 24, 1853), I had the honor of receiving a commission from the
governor of Missouri, directing me to make:

" 'A thorough geological and mineralogical survey of this state,
with a view to determine the order, succession, arrangement, relative
position, dip, or inclination, and comparative magnitude of the several
strata, or geological formations within the state; and to discover and
examine all beds or deposits of ore, coal, marls and such other mineral
substances and mineral waters as may be useful or valuable; and to
perform such other duties as may be necessary to make a full and com-
plete geological and mineralogical survey of the state.'

"On April 15, I appointed Dr. A. Litton, chemist; R. B. Price,
draughtsman; on May 24, Frederic Bass, assistant; in the fall,
B. F. Shumard . . ." G. C. SWALLOW.

During the period of the survey which lasted from 1853 to
the outbreak of the Civil War, Swallow was assisted by A. Litton
(1853-61), B. F. Shumard (1853-58), F. B. Meek (1855), G. C.
Broadhead (1857-61), A. Ulfers (1854, 1860), C. G. Wheeler
(1860), P. C. Swallow (1857-61), R. B. Price (1853-58), W.
Hough (1857), Frederick Hawn (1854), Henry Engelmann

(1857), J. G. Norwood (1858-61), Dr. John Locke (1860), Daniel Crosby and Edward Harrison.

According to MERRILL (see Bibliography; 1920, below), the expenses of the survey for the nine years of its existence was \$105,000. Reports were issued in 1854, 1855, 1857, 1859 and 1861. See also below the Bibliography, and the PAPERS IN SOCIETY TRANSACTIONS, for preliminary papers often issued before the Reports, descriptive of the collections, etc.

The Western Journal & Civilian, a technical journal published in St. Louis, and the Historical and Philosophical Society of the state of Missouri (1844), q.v., were early active advocates of a state geological survey and were instrumental in bringing it about.

See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 307-8.

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Signed by Messrs. Falkland, H. Martin, Sol. D. Carruthers, S. T. Glover, W. G. Minor, De Witt C. Ballou.

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- p. 15-207 SWALLOW, G. C. First and second annual reports with five chapters on the geology of Missouri.
p. 15-22 First annual report: Nov. 10, 1853.
p. 23-32 Second annual report: Dec. 1, 1854.
p. 33-207 Introduction and chapters 1-5.

Part 2, 240 p.

- p. 3- 94 LITTON, A. A preliminary report on some of the principal mines in Franklin, Jefferson, Washington, St. Francis, and Madison Counties, Missouri. Written Dec. 27, 1854.
- p. 95-119 MEEK, F. B. Report on Moniteau County. Written Dec. 1, 1854.
- p. 121- 36 HAWN, Frederick. Report. Feb. 1, 1854.
- p. 137-208 SHUMARD, B. F. Report. 3 pl. [45 fig.] Written Nov. 1855.

- p. 139-84 Description of a geological section on the Mississippi River, from St. Louis to Commerce.
p. 185-208 Palaeontology.
- p. 209- 12 SWALLOW, G. C. What was known of our geology. Appx. A.
- p. 213- 20 ————. Use of fossils, with catalogues. Appx. B.
- p. 221- 26 ————. Trees and shrubs. Appx. C.
- p. 227- 38 ————. Glossary.
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- 1859 ————. Fourth report of progress . . . Dec. 22, 1858. Jefferson City, 1859. (In 20th Gen. Assem., 1st sess., 1858. Jour. appx. p. 97-106).
- 1859 ————. Geological report of the country along the line of the southwestern branch of the Pacific Railroad, state of Missouri, to which is prefixed a memoir of the Pacific Railroad. St. Louis, Knapp & co., 1859. 17+93 p. pl. map.
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- . Quaternary deposits of Missouri.
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- 1859 SHUMARD, B. F. Observations on the geology of the county of St. Genevieve, being an extract from a Report made to the Geological Survey of Missouri, in 1859.
Rd before Acad. Sc. St. Louis (1856), June 6, 1859. In its Trans v. 1, p. 404-15, 1 pl.

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NEW ORLEANS ACADEMY OF SCIENCES (1853)

History

The existence of a Lyceum of Natural History in New Orleans is noted in the American Journal of Science, v. 10, p. 376, February 1826 (by S. E. Dwight).

On April 1, 1853, the New Orleans Academy of Sciences was organized, the primary object of which was "to advance science in all its departments." The officers for 1853 were Josiah Hale, M.D., president; J. S. Copes, vice-president; A. W. Ely, secretary.

The Society was incorporated in 1856. Its Proceedings for 1853-54 were published in a short volume on March 1, 1854. The Academy was divided into thirteen sections, of which sections one to three comprised the natural history sciences. The Academy was also interested in advocating and finally securing a geological survey of the state of Louisiana.

Active natural history members of the Academy during the period 1853-65 were John L. Riddell, W. P. Riddell, Bennet Dowler, N. B. Benedict, P. E. Bonford, A. G. Blanchard, W. A. Gordon, L. von Reizenstein, Caleb Forshey, and Messrs Picton, Crawcour and Chilton.

A large collection of natural history material and a library were formed during this period, but were broken up and dispersed during the war. A brief account of the history of the Society may also be found in the Academy's Papers. v. 1, no. 1, p. 5-7, 1886-87, in an address by the president, John B. Elliott. The collections which survived the war were turned over to the Museum of Tulane University.

Bibliography

- 1854 NEW ORLEANS ACADEMY OF SCIENCES. Proceedings . . . from May, 1853 to February, 1854 . . . New Orleans, March 1, 1854. 71 p.

This was v. 1, no. 1, all that was published.

- . Constitution and by-laws. New Orleans, 1854. 22 p.
- 1858 ———. Report of the special committee of the . . . appointed Dec. 7, 1857, "to investigate and report, at as early a day as practicable, upon the subject of a geological and scientific survey of the state of Louisiana, with a view to bringing the matter before the Legislature of the state, at the commencement of the ensuing annual session, unanimously adopted, Feb. 1, 1858." New Orleans, 1858. 13 p.
Committee consisted of J. L. Riddell, N. B. Benedict, A. G. Blanchard, W. A. Gordon, and P. E. Bonford.
- 1859 ———. Constitution and by-laws . . . together with a list of the fellows, honorary and corresponding members . . . New Orleans, 1859. 13 p.
- 1863 REIZENSTEIN, L. von. Catalogues of the Lepidoptera of New Orleans and vicinity. New Orleans, 1863. 10 p.
- 1866 NEW ORLEANS ACADEMY OF SCIENCES. Memorial of the . . . to the Senate and House of Representatives of the state of Louisiana. New Orleans, 1866. 8 p.
- 1886 ———. Papers . . . v. 1, no. 1-2. New Orleans, 1886-88.

THE PACIFIC RAILROAD SURVEYS (1853)

History

"Shortly before the close of the session of Congress in March, 1853, an appropriation of \$150,000 was made to defray the expenses of the Survey of the various routes along which it was supposed that a railroad might be constructed from the Mississippi River to the Pacific Ocean. For this purpose six parties were organized by the War Department for the survey of four main routes, and in a short space of time they were in the field.

"All the parties were fitted out in the most complete manner; the natural history apparatus and material prepared under the direction of the SMITHSONIAN INSTITUTION (1846), q.v., who also furnished the necessary instructions as to the objects most important to be collected. In its efforts to secure the assignment to these parties of persons capable of making collections and observations in natural history, it was met by the hearty co-operation of the War Department through the heads of the different expeditions and Captain A. A. Humphreys, in charge of the Pacific Railroad Surveys Office . . .

"The main divisions of routes, personnel, etc., were:

1. Line of the 47th parallel under Gov. I. I. Stevens, 1853-55.
2. Line of the 38th, 39th and 41st parallels under Lts. Gunnison and Beckwith—1853-54.
3. Line of the 35th parallel under Lt. Whipple.
4. California line under Lts. Williamson and Abbot.
5. Line of the 32d parallel—west under Lt. Parke.
6. Line of the 32d parallel—east under J. Pope.

"The collections of all the government parties just mentioned were transmitted, from time to time, to the Smithsonian Institution, and were there properly cared for, until the return of the several expeditions. They were then placed into the hands of the naturalists selected to elaborate them, and the necessary drawings prepared within its walls, under the direction of the Institution, to which was also committed the general supervision of the engraving and printing of the plates . . ." BAIRD, S. F., in *Pacific RR. Surv.* v. 8, *Intro.* p. 13. 1857. (Serial 765 or 798 of U. S. Documents).

The general instructions of the Secretary of War, Jefferson Davis, as given to the commanders of the various expeditions were briefly as follows: "They were directed to observe and note all the objects and phenomena which have an immediate or remote bearing upon the railway, or which might seem to develop the resources, peculiarities, and climate of the country; to determine the geographical positions, obtain the topography, observe the meteorology, including the data for barometric profiles, and two of the parties were to determine the direction and intensity of the magnetic force. They were to make a geological survey of the lines; to collect information upon, and specimens of, the botany and zoology of the country; and to obtain statistics of the Indian tribes which are found in the regions traversed . . ." DAVIS, Jefferson. *Report of Sec. War. Pacific RR. Surv.* v. 1, p. 7-8. (Serial 758 or 791).

For a discussion and critical estimate of the geological and palaeontological aspects of the series of explorations conducted under the Pacific Railroad Surveys, see also MERRILL, (1), p. 449-56. (See *Annot. Bib.*). See also WARREN, v. 11, of these Reports for complete routes followed, etc. See also MERRILL. *First 100 yrs. Amer. Geol.* 1924. p. 310-19.

The material for these Surveys is arranged as follows:

- 1) A brief history of each exploration.
- 2) Bibliographical presentation and analysis of the various reports, taken approximately in their numerical order.

(A) contains analysis of the initially contemplated reports which appeared only in 3 v. and was abandoned for

(B) which contains a complete, comprehensive bibliographical analysis of the 12 v. constituting the set of Reports; with references to (A), where necessary, etc.

3) After each expedition or volume, is added a section PAPERS IN SOCIETY TRANSACTIONS, recording the articles written before or after the publication of the official reports, which concern the respective explorations.

Under (B), will be found a summary of the volumes in the set, for rapid reference use.

For convenience, the serial numbers of the volumes as they are found in the United States documents, are given in order to facilitate cross reference, as the set of Reports was published in both a House and a Senate edition.

STEVENS' EXPEDITIONS (See v. 1 & v. 12)

47th & 49th Parallels

"This Expedition, as first organized consisted of four separate parties. The one under Gov. Stevens' personal supervision, operated from St. Paul westward towards the mouth of White Earth River; thence on the prairies lying along the Missouri River to the Rocky Mountains; and then among the passes of that region.

Another under Capt. G. B. McClellan began at Fort Vancouver, on the Columbia, operated northeastward, examining the passes of the Cascade range; and then eastward to join Gov. Stevens' party. Another party under Lt. A. J. Donelson, examined the Missouri River from its mouth to the Yellowstone—where a junction was made with that under Gov. Stevens. The fourth party under Lt. R. Saxton conducted a reconnaissance from Fort Walla-Walla to the Bitter-Root Valley, where a depot was established . . ."

WARREN, v. 11, p. 66-7.

Gov. Stevens was assisted on this expedition by Brevet Capt. McClellan, Lt. C. Grover, F. W. Lander and A. W. Tinkham, engineers; J. Moffett and J. Doty, meteorologists; G. W. Stevens,

assistant astronomer; J. M. Stanley, artist; S. F. Baird was the naturalist in charge. Dr. John Evans, then geologist of Oregon and Washington territories, was appointed geologist to the expedition. Drs. J. G. Cooper and George Suckley were appointed surgeons and assistant naturalists. George Gibbs was geologist and ethnologist to the expedition.

Cooper and Gibbs accompanied McClellan's party; Suckley was with Stevens. Reconnaissances and explorations continued through 1855, the expedition first setting out June 8, 1853, from St. Paul. Gov. Stevens was during the period of the expedition governor of Washington Territory. His Report was rendered May, 1860, the preliminary report (in v. 1) having been made in 1855. Dr. Evans, the official geologist of the party, lost his reports in transmission to Washington. Several preliminary papers appeared in Society Transactions (see v. 12).

Details of the routes followed will be found in WARREN, p. 66-73. For preliminary Report, see v. 1 & for the Final Report and Scientific Appendixes, see v. 12 (which in the House ed. is in 2 v.).

Dr. Evans' MSS regarded as lost, is now, according to G. P. Merrill (First 100 yrs. Amer. Geol. 1924. p. 318, ft. note), in the archives of the Smithsonian Institution, having been deposited there in 1917 by D. I. Bushnell, Jr.

GUNNISON & BECKWITH'S EXPEDITIONS (see v. 2)

38th & 39th Parallels & the 41st

This expedition was organized under orders dated May 20, 1853, under the direction of Capt. J. W. Gunnison, who was barbarously murdered by the Indians on Oct. 26, 1853. Lt. E. G. Beckwith thereupon assumed command of the party for the remaining period of exploration, and submitted his Report based on Gunnison's notes.

Dr. James Schiel accompanied the expedition as surgeon and naturalist. His specimens were forwarded to the Smithsonian Institution. F. Creutzfeld was the botanist of the expedition; R. H. Kern, topographer; they were both murdered by the Indians Oct. 26, 1853. Creutzfeld made large botanical collections.

The route followed, according to WARREN, p. 73-5, was: "The more minute reconnaissance will continue up the Huerfano into the San Luis Valley, and thence through the most eligible pass to

the valley of Grand River, and westwardly to the vicinity of the Vegas de Santa Clara; and thence . . . either along the Nicollet River on to the west of the range of mountains bordering that stream, into the basin, upon the route to the Great Salt Lake; thence to Utah Lake and through the Timpanagos Canon or other passes across the Weber and Bear Rivers, by the Coal Basin to Fort Laramie."

Gunnison's Report as edited by Beckwith was rendered Nov. 25, 1854. (see v. 2, pt. 1). His own (v. 2, pt. 2) was submitted Dec. 30, 1854. After tiding over the winter of 1853-54 in Salt Lake City, Beckwith resumed explorations with the surviving members of the expedition on April 4, 1854. Survey was completed in July, 1854.

J. A. Snyder collected the plants on Beckwith's Expedition in 1854. The descriptions were referred to Messrs. John Torrey and Asa Gray, who rendered the official report on the botany. For route followed by Beckwith in 1854, see WARREN, p. 75-6.

POPE'S EXPEDITION (see (B), v. 2, pt. (4))

32d Parallel

For the route followed by Pope's Expedition along the 32d parallel from the Red River to the Rio Grande, see WARREN, p. 79-80. No regular geologist or naturalist was employed on this expedition but collections of geological, botanical and zoological specimens were made by C. L. Taplin, L. H. Marshall, and Dr. Dieffenderfer, Pope's assistants. The specimens were submitted to and described by W. P. Blake (geology, etc.), Torrey & Gray (botany), Baird (zoology). Blake made a special report on the geology of the expedition sent to him by Pope. J. C. Booth reported on the soils. See also (A), v. 2, Serial no. 737, pt. (4).

PARKE'S EXPLORATIONS (see v. 2, pt. (5), & v. 7)

32d Parallel, & California

From February 16 to March 24, 1854, Lt. J. G. Parke explored the country lying near the 32d parallel between Dona Ana on the Rio Grande, and the Pimas Villages on the Gila. His Report was rendered August 22, 1854. He was assisted by Lt. George Stoneman, A. L. Heermann, physician and naturalist, and Henry Cus-

ter, assistant topographer. For route followed, see WARREN, p. 79. (See below v. 2, pt. (5), for Report).

From November 22, 1854, through May, 1855, Lt. Parke, assisted by Albert H. Campbell, chief assistant, Thomas Antisell, geologist and naturalist; A. L. Heermann, naturalist, made explorations from the San Francisco Bay to Los Angeles, and from the Pimas Villages on the Gila to the Rio Grande. His Report was rendered February 9, 1857.

His instructions were as follows:

"(1) To make such explorations and surveys as will determine the practicability of a railroad from the Bay of San Francisco to the plains of Los Angeles by a route west of the Coast Range.

"(2) To determine whether the valley of the Mojave River joins that of the Colorado, and will afford a practicable route for a railroad; and to explore the line recommended for examination by Lt. Whipple, from Soda Lake, Mojave River, to the Colorado River, by the Chem-e-huevas plain or valley.

"(3) To make the additional examinations and surveys, recommended in your report upon the route from the Pimas Villages to the Rio Grande." A. A. HUMPHREYS.

The Zoological reports by A. Heermann and Edward Hallowell appeared in v. 10 of the set, published in 1859. See v. 7, Contents, below. John Torrey made the botanical report; and Thomas Antisell the geological, with a chapter on the palaeontology by T. A. Conrad.

WHIPPLE'S EXPLORATIONS (v. 3-4)

35th Parallel

Lt. Whipple, assisted by Lt. J. C. Ives; J. M. Bigelow, surgeon and botanist; Jules Marcou, geologist and mining engineer; C. B. R. Kennerly, physician and naturalist, conducted explorations along the 35th parallel from the Mississippi River to the Pacific Ocean, between July 13, 1853, when the party left Fort Smith, to March 25, 1854.

Whipple's Report was rendered June 30, 1855, in two volumes, v. 3-4 of the set (q.v. below, for contents). His initial Report also appeared in (A), v. 2, pt. (3), Serial no. 737 (q.v. below).

H. B. Mollhausen was attached to the expedition in the capacities of topographer and artist. Marcou took his notes abroad con-

trary to government orders; and when they were returned, they were placed in the hands of W. P. Blake, who drew up the Report and the map. The Zoological contents of the Explorations were published in v. 10, in 1859 (see v. 4, below). For the routes followed by the Whipple parties, see WARREN, p. 76-8.

A report on the Indian tribes was made by Messrs. Whipple, Ewbank and Turner; that on fossils, by James Hall; those on botany by J. M. Bigelow, John Torrey, W. S. Sullivant, George Engelmann, Asa Gray; those on zoology by Charles Girard, S. F. Baird, C. B. R. Kennerly.

WILLIAMSON'S EXPEDITION (see v. 5)

Connecting 35th & 32d Parallels

Lt. R. S. Williamson received the following instructions for a survey of a route connecting those of the 35th and 32nd parallels. His instructions were as follows:

"1) The party for this exploration and survey will be commanded by Lt. R. S. Williamson, who will be aided by Lt. J. G. Parke, one mineralogist and geologist, one physician and naturalist, two civil engineers, one draughtsman . . .

2) The party will rendezvous at Benicia, in the passes of the Sierra Nevada leading from the San Joaquin and Tulare Valleys, and subsequently explore the country to the southeast of the Tulare Lakes, to ascertain the most direct practicable route for a railroad between Walker's Pass, or such other pass as may be found preferable, and the mouth of the Gila; from this point the survey will be continued to San Diego . . ." HUMPHREYS, A. A.

Work was begun on July 10, 1853, and completed at the end of the year. Williamson's Report was rendered Dec. 31, 1854. Dr. A. L. Heermann, the physician and naturalist of the expedition, made large natural history collections. W. P. Blake, geologist and mineralogist of the party, made an extensive report (of which a special ed. pub. 1858, was issued by himself—see below): PAPERS IN SOCIETY TRANSACTIONS: 1858.

Brief reports were made by Louis Agassiz, A. A. Gould, J. D. Easter, T. A. Conrad, J. W. Bailey, G. C. Schaeffer, John Torrey, Elias Durand, T. C. Hilgard, Edward Hallowell, S. F. Baird, Charles Girard.

The Zoological Report, pt. 4 of the Report, appeared in v. 10, Wash. 1859. For contents, see below: v. 5, pt. 4.

See also MERRILL, (1), p. 449-56. (See Annot. Bib.). For details of routes, etc., see also WARREN, p. 78-9. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 313-15.

WILLIAMSON & ABBOT'S EXPEDITION (see v. 6)

Sacramento Valley to Columbia River

Early in 1855, Lt. R. S. Williamson, assisted by Lt. H. L. Abbot, received instructions:

"1) To make such explorations and surveys as will determine the practicability, or otherwise, of connecting the Sacramento Valley, in California, with the Columbia River, Oregon Territory, by a railroad, either by the Willamette Valley, or . . . by the valley of the Des Chutes River, near the foot slopes of the Cascade chain . . .

2) To make the necessary examinations and surveys to determine if a route practicable for a railroad exists crossing the Sierra Nevada, at or near the source of Carson River. This may furnish the most direct railroad route from San Francisco to the Great Salt Lake . . . The geological information is considered especially valuable in determining the character of the country, the nature of the difficulties to be encountered . . . Your attention is directed to the botany and natural history of the country . . ." A. A. HUMPHREYS.

The expedition was carried on between July 10 and the middle of November, 1855. The Report, written by Lt. Abbot, owing to Lt. Williamson's illness, was rendered May 6, 1857. During the latter part of the survey, Lt. Abbot led a detached expedition.

J. S. Newberry was the geologist of the expedition; and E. Sterling, the zoologist. Owing to a protracted illness, he was, however, compelled to relinquish his duties at Fort Dalles. Zoological collections were made by C. D. Anderson and Lt. W. P. Trowbridge.

For the contents of v. 6, the Final Report of the Expedition, see below, (B), v. 6. See also MERRILL, (1), p. 455. (See Annot. Bib.). See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 317. For routes followed, see also WARREN, p. 81-2.

The natural history collections gathered on the Expedition were described by Newberry, T. A. Conrad, E. N. Horsford, L. M.

Dornbach, Asa Gray, John Torrey, W. S. Sullivan, Edward Tuckerman, Charles Girard, S. F. Baird, W. G. Binney. See below, (B), v. 6, Contents.

Number 4 of the Zoological Report, on the Reptiles collected, by Baird, was published in v. 10.

ZOOLOGICAL COLLECTIONS (see v. 8, 9, 10)

The general reports on the zoological collections gathered by the various parties of the Pacific Railroad Surveys are incorporated in (B), v. 8, 9 & 10. They contain descriptions of the specimens collected officially during the Pacific RR. Surveys and descriptions of those collected by several other expeditions, namely: WARREN'S SIOUX EXPED. (1855), q.v.; WARREN'S EXPLOR. NEBRASKA & DACOTAH (1856), q.v.; NORTHWESTERN BOUNDARY SURV. (1857), q.v.; U. S. & MEXICAN BOUNDARY SURVEY (1848), q.v.; BRYAN'S EXPED. FROM FORT RILEY TO BRIDGER'S PASS (1856), and MARCY'S EXPLOR. BIG WICHITA (1854).

Large collections were also made by various individuals and sent to the SMITHSONIAN INSTITUTION (1846), q.v., the government repository for the specimens. They were made by John Potts, Maj. Rich, Lt. Couch, Col. Alfred Vaughan, Richard D. Cutts, John F. Hammond, E. Samuels, G. H. Thomas, W. S. King, A. S. Taylor, C. C. Boyle, W. F. Tolmie, Dr. Belandiere, J. F. Head, S. W. Manney, Charles Cavileer, W. A. Hammond, Alexander, Thaddeus and Ferdinand Culbertson, L. A. Edwards, S. W. Crawford, J. S. Bowman, Dr. Swift, Edward T. Dennig, Capt. S. Van Vliet, Maj. J. H. Carleton.

The fitting out of the Expeditions for the making of natural history collections was in the hands of the Smithsonian. For an account of the various collections, etc., see Preface to v. 8.

For the contents of the 3 volumes of the general report, see below, (B), v. 8, 9, 10. Volume 10 contains also the zoological reports of the separate expeditions which were written too late to be incorporated in the reports of the individual expeditions.

WARREN'S MEMOIR (see v. 11)

"My instructions were to carefully read every report and examine every map of survey, reconnaissance, and travel which

could be obtained, to ascertain their several values, and to embody the authentic information in the map . . .” WARREN, G. K., in his letter to Capt. A. A. Humphreys, Mar. 1, 1858.

For contents, see below (B), v. 11. An invaluable guide to the routes, personnel, etc., of the various expeditions in the United States from 1800 to 1857. Includes a number of which there were only MSS reports in the files of the War Dept. records. Contains the final map.

Bibliography & Reports

(A)

- 1855 U. S. WAR DEPARTMENT. PACIFIC RAILROAD SURVEYS. . . . Report of the Secretary of War communicating the several Pacific Railroad explorations. Washington, A. O. P. Nicholson, printer, 1855-56. 3 v. (4 v.) illus. maps. (In U. S. 33rd Cong., 1st sess., H. Ex. Doc. v. 18, no. 129. 4 parts). Serials no. 736, 737, [738], 739.

“Serial no. 738 was never printed. Serial no. 739 contains the maps. House resolution of Aug. 3, 1854, directed the printing of the reports during the recess, i.e., between Aug. 7, 1854, adjournment, 1st session and Dec. 4, 1854, assembling of 2d sess., 33d Cong.

Presumably Serials no. 736, 737, and 739 were printed under this order, though the Report of Jefferson Davis, Sec. of War, which is the first paper in v. 1, is dated Feb. 27, 1855.

The House on Feb. 14, and the Senate on Feb. 24, 1855, each ordered 10,000 copies of these reports, specifying additional matter to be included.

This accounts for the non-appearance of no. 738 (v. 3 of the first projected series, 8°.), as the matter contained in the eleven quarto volumes (see (B) below), printed under these later orders includes not only the contents of Serials no. 736, 737, and 739, but that listed to appear as 738, and much additional matter.”

Extracts from U. S. Congressional Documents. Tables & Index. Wash. 1902. p. 551 (note).

CONTENTS:

v. 1, Serial no. 736

Wash. 1855. 43 + 117 + 4 + 12 + 599 + 15 p. illus.

CONTENTS:

(1)

DAVIS, Jefferson. Report of the Secretary of War. Wash. 1855. 43 p.

Gives outlines of the routes of the various explorations. Repr. in (B), v. 1, (7), Serial no. 758 & 791, q.v.

(2)

HUMPHREYS, A[ndrew] A[tkinson], and WARREN, G[ouverneur] K[emble]. An examination by direction of the Hon. Jefferson Davis, Sec. of War, of the Reports of the Explorations for railroad routes from the Mississippi to the Pacific, made under the orders of the War Department in 1853-54, and of the explorations made previous to that time, which have a bearing upon that subject. Wash. 1855. 117 p.

Repr. in (B), v. 1, (2), Serial no. 758 & 791, below. Cont. in (B), v. 7, (2), Serial no. 764 or 797, q.v.

(3)

JESUP, T[homas] S. Report. Wash. 1855. 4 p.

Repr. in Serials no. 758 or 791, (B), v. 1, (4), q.v. below.

(4)

STEVENS, I[saac] I[ngalls]. Report of the exploration of a route for the Pacific Railroad, near the forty-seventh and forty-ninth parallels, from St. Paul to Puget Sound. Wash. 1855. 12 + 599 + 15 p.

Repr. in (B), v. 1 & 12, below, q.v.

For history, personnel, routes, etc., see above, History: STEVENS' EXPEDITION.

CONTENTS:

- p. 1-103 STEVENS, I. I. Report. ch. 1-18.
- p. 103-599 Papers accompanying Gov. Stevens' Report.
- p. 179-82 COOPER, J. G. Natural history report.
- appx. 15 p. HUNT, E. B. Alphabetical index.
- v. 2, Serial no. 737, 1855
- 149 + 136 + 154 + 8 + 324 p. illus.

CONTENTS:

(1)

BECKWITH, E. G., and GUNNISON, J. W. Report of explorations of a route for the Pacific Railroad, near the 38th and 39th parallels of latitude, from the mouth of the Kansas to Sevier River, in the Great Basin. 149 p.

Rendered Nov. 25, 1845.

Repr. in (B), v. 2, pt. (1), Serial 759 & 792 (below)

(2)

BECKWITH, E. G. Report of explorations for the Pacific Railroad, on the line of the forty-first parallel of north latitude. 136 p.

Rendered Dec. 30, 1854.

Repr. in (B), v. 2, pt. (2), Serial no. 759 & 792, (below)
p. 120-35 SCHIEL, James. Geological report of the country explored under the 38th and 41st parallels of north latitude, in 1853-54.

Repr. in (B), v. 2, pt. (2), see below.

p. 135-36 BAILEY, J. W. Letter . . . upon infusorial fossils submitted by Dr. Schiel.

Repr. in (B), v. 2, pt. (2), see below.

(3)

WHIPPLE, A[miel] W[EEKS]. Report of explorations for a railway route, near the thirty-fifth parallel of latitude, from the Mississippi River to the Pacific Ocean. 154 + 8 p.

Rendered July 31, 1854.

Repr. in (B), v. 3-4, Serials, no. 760 & 761; & no. 793-794, (q.v. below)

For history, personnel, etc., see above, History: WHIPPLE'S EXPLORATIONS.

CONTENTS:

p. 5-40 WHIPPLE, A. W. Report. ch. 1-5.

See below (B), v. 3, pt. 1

p. 40-8 MARCOU, Jules. Résumé of a geological reconnaissance extending from Napoleon at the junction of the Arkansas with the Mississippi to the Pueblo de Los Angeles, in California. ch. 6. Written July 26, 1854.

See below (B), v. 3, pt. 4, p. 121-75.

p. 49-54 KENNERLY, C. B. R. Economical zoology—game and their means of subsistence. ch. 7. Written July 1, 1854.

p. 54-71 BIGELOW, J. M. General description of the soil and productions along the route traversed; remarks upon timber and fuel. ch. 8. Written Aug. 1854.

See below (B), v. 4, pt. 5, p. 1-16.

p. 71-5 ——— Description of special forest trees along the route—Douglass' spruce or Oregon pine . . .

See also (B), v. 4, pt. 5, p. 17-26.

p. 75-81 ——— Descriptions of special forest trees in California. ch. 10.

See also (B), v. 4, pt. 5, p. 17-26.

p. 81-154 WHIPPLE, A. W., and others. Miscellaneous reports. ch. 11 and appx.

(4)

POPE, John. Report of exploration of a route for the Pacific Railroad, near the 32d parallel of latitude, from the Red River to the Rio Grande. 324 p.

Rendered Oct. 17, 1854. Repr. in (B), v. 2, pt. (3), Serial no. 759 or 792, q.v. below.

For personnel, history, etc., see above, History: POPE'S EXPEDITION.

CONTENTS:

- p. 5- 65 POPE, John. Report. ch. 1-8
 p. 66-124 BYRNE, J. H. Diary of the expedition. ch. 9-12
 p. 125- 28 MARCOU, Jules. Geological notes of a survey of the
 country comprised between Preston, Red River,
 and El Paso, Rio Grande del Norte. ch. 13.
 Written Sept. 21, 1854.
 p. 128, 307-24 TORREY, John. Botanical report. ch. 14, etc.
 p. 129 BAIRD, S. F. Natural history. ch. 15.
 p. 130- 34 BOOTH, J. C. Soils and mineral waters. ch. 16.
 p. 135-306 Meteorological and astronomical observations.
 See also (B), v. 4, appx. 288 p.

(A), v. 3, Serial no. 738

Not Published.

(A), v. 4, Serial no. 739

Contains the Survey Maps.

See below (B), v. 11.

(B)

(1) Senate Set., Serials no. 758-768, 992.

- 1855 U. S. WAR DEPARTMENT. PACIFIC RAILROAD SURVEYS.
 . . . Reports of explorations and surveys, to ascertain the most
 practicable and economical route for a railroad from the Mississippi
 River to the Pacific Ocean, made under the direction of the Secre-
 tary of War, in 1853-4, according to acts of Congress of March 3,
 1853, May 31, 1854, and Aug. 5, 1854. Washington, 1855-60. 12
 v. illus. pl. maps, sect. diagr. tab. 4°. (In U. S. 33d Cong.,
 2d sess., Sen. Ex. Doc. v. 13, no. 78, 11 parts.) Serial nos. 758-
 768, (992).

v. 12 is suppl. to v. 1, and is (In U. S. 35th Cong., 2d sess., Sen.
 Ex. Doc. v. 18, no. 46) Serial no. 992.

(2) House Set., Serials no. 791-801, 1054-1055.

- 1855 ———. Same. . . . Washington, 1855-60. 12 v. in 13. illus.
 pl. maps. (In U. S. 33d Cong., 2d sess., H. Ex. Doc. v. 11, no.
 91, 11 parts) Serials nos. 791-801, (1054-1055).

v. 12 is suppl. to v. 1 & in House set is in 2 v. (In U. S. 36th
 Cong., 1st sess., H. Ex. Doc. v. 11, no. 56, 2 parts) Serials no.
 1054 & 1055.

Reports were reviewed in 1) Amer. J. Sc. v. 72, (ser. 2, v. 22),
 p. 67-95. July, 1856; 2) North Amer. Rev. v. 82, p. 211-36.
 Jan. 1856.

See also MERRILL, 1, p. 449-56. (See Annot. Bib.) Also in MER-
 RILL. First 100 yrs. Amer. Geol. 1924. p. 310-19.

See also WAGNER, H. R. Plains & Rockies . . . 1860-1865. San
 Francisco, 1921. p. 119-28 for bibliographical notes.

SUMMARY OF CONTENTS OF VOLUMES (B)

- v. 1, 1855, (1) Report of Secretary of War by Jeff. Davis. 33 p.
- (2) Examination of the reports of the several routes explored by A. A. Humphreys, and G. K. Warren. p. 35-111.
- (3) Railway memoranda, by G. B. McClellan. p. 113-30.
- (4) Report, by T. S. Jesup. p. 131-34.
- (5) Report, by I. I. Stevens. 651 p. (see also v. 12, below)
- v. 2, 1855, (1) Gunnison & Beckwith's Report. 128 p.
- (2) Beckwith's Report. 132 p.
- (3) Lander's Report. 45 p.
- (4) Pope's Report. 185 + 50 p.
- (5) Parke's Report. 28 p. (see also v. 7)
- (6) Extract from Emory's Report. 22 p.
- v. 3, 1856, Whipple's Report. pt. 1-4.
- v. 4, 1856, Whipple's Report. pt. 5-6.
- v. 5, 1856, Williamson's Report.
- v. 6, 1857, Williamson & Abbot's Report.
- v. 7, 1857, (1) Parke's Report.
- (2) Conclusion of official review of reports: 1855-57, by A. A. Humphreys. 37 p.
- v. 8, 1857, Zoological Report of Survey: pt. 1, Mammals, by Baird.
- v. 9, 1858, Zoological Report of Survey: pt. 2, Birds, by Baird, Lawrence and Cassin.
- v. 10, 1859, (1) Zoological Report of Survey: pt. 3, Reptiles by Baird, and Fishes, by Girard.
- (2) Individual Zoological Reports for the various expeditions.
- v. 11, 1859, Warren's Memoir, and General Map.
- v. 12, 1859, Stevens' Final Report. (House ed., 2 v.)

(B), v. 1, Serial no. 758 or 791

1855 STEVENS, I[saac] I[ngalls]. . . . Report of explorations for a route for the Pacific Railroad, near the forty-seventh and forty-ninth parallels of north latitude from St. Paul to Puget Sound. Washington, 1855. 134 + 651 p. 4°. (Pacific R.R. Surv. v. 1)

Repr. from (A), v. 1, Serial no. 736 (q.v. above).

For the routes followed and the personnel of the staff, see above, History: STEVENS' EXPED.

For FINAL REPORTS, see v. 12, below.

CONTENTS: (of v. 1)

- (1.) DAVIS, Jefferson. Report of the Secretary of War on the several railroad explorations. 33 p.
Repr. from (A), v. 1, Serial no. 736, (1).
- (2.) HUMPHREYS, A. A., and WARREN, G. K. Examination of the reports of the several routes explored; by A. A. Humphreys & G. K. Warren. p. 35-111.
Concluded in v. 7, (q.v.)
Repr. from (A), v. 1, Serial no. 736., (2).

- (3.) MC CLELLAN, G. B. Memoranda on railways. . . p. 113-30.
- (4.) JESUP, T. S. Report upon the cost of transporting troops and supplies . . . p. 131-34.
Repr. from (A), v. 1, Serial no. 736, (3).
- (5.) STEVENS, I. I. Report
Repr. from (A), v. 1, Serial no. 736, (4).
- Pt. 1, p. 1-72 Reports from the field.
- p. 7-8 STANLEY, J. M. Memoranda in relation to sketches in natural history, geology, botany, and to views of scenery and natural objects.
- p. 9-10 BAIRD, S. F. Memoranda in reference to natural history operations.
- p. 10-1 ————— Memorandum of apparatus for making collections in natural history, supplied to the several parties of Maj. I. I. Stevens.
- p. 11-3 EVANS, John. Mineralogical and geological directions to the corps.
- Pt. 2, p. 73-159 STEVENS, I. I. Report and narrative. Contains ch. 1-18.
- p. 160-651 Papers accompanying Gov. Stevens' Report.
- p. 160-77 LAMBERT, John. Report of the topography of the route from the Mississippi River to the Columbia.
Also in (A), v. 1, Serial no. 736, p. 103-22.
- p. 203-19 DUNCAN, J. K. Topographical report of the country in the region of the Cascade Mountains. Written Feb. 21, 1854.
Also in Serial no. 736, p. 157-78.
- p. 219-21 COOPER, J. G. Natural history report . . . of the western division.
Also in Serial no. 736, p. 179-82.
- p. 251-69 SAXTON, R[ufus]. Report of the route from the Columbia Valley to Fort Owen, and thence to Fort Benton.
Written Feb. 1854. Also in Serial no. 736, p. 219-44.
- p. 291-301 SUCKLEY, George. Report of his trip in a canoe from Fort Owen, down the Bitter Root, Clark's Fork, and Columbia Rivers to Vancouver. Written Dec. 19, 1853.
Also in Serial no. 736, p. 273-87.
- p. 301-19 MULLAN, John. Report of an exploration from Fort Benton to the Flathead Camp, beyond the Muscle Shell River, and thence by the southern Little Blackfoot River to the St. Mary's Valley. Written Jan. 20, 1854.
Also in Serial no. 736, p. 287-311.
- p. 319-52 ————— Reports of explorations.
Also in Serial no. 736, p. 312-55.

p. 465-73 GIBBS, George. Report on a reconnaissance of the country lying upon Shoalwater Bay and Puget Sound. Written Mar. 1, 1854.

Also in Serial no. 736, p. 483-94.

p. 473-86 ——— Report on the geology of the central portion of Washington Territory.

Written May 1, 1854. Also in Serial no. 736, p. 494-512.

p. 486-515 GROVER, C. Reports.

Also in Serial no. 736, p. 561-98.

p. 515-40 MULLAN, John. Reports.

p. 542-65 DOTY, James. Reports.

p. 637-51 HUNT, E. B. Alphabetical index.

(B), v. 2, Serial no. 759 or 792

(1)

- 1855 BECKWITH, E[dward] G[riffin], and GUNNISON, J[ohn] W[illiam]. . . . Report of explorations for a route for the Pacific Railroad by Capt. J. W. Gunnison . . . near the 38th and 39th parallels of north latitude, from the mouth of the Kansas River, Mo., to the Sevier Lake, in the Great Basin. Washington, 1855. 128 p. 13 col. pl. 4°. (Pacific R.R. Surv. v. 2)

Written Nov. 25, 1854. Repr. from (A), v. 2, Serial no. 737. 149 p. (see above)

Scientific Contents are in pt. (2), below.

See also (U. S. 33rd Cong., 1st sess., H. Ex. Doc. v. 5, no. 18), Wash. 1854. 10 p. Serial no. 717. Brief report by Gunnison.

For history, personnel, etc., see above, History: BECKWITH & GUNNISON'S EXPED.

(2)

- 1855 BECKWITH, E[dward] G[riffin]. . . . Report of explorations for a route for the first Pacific Railroad, of the line of the forty-first parallel of north latitude, 1854. Washington, 1855. 132 p. 14 pl. (Pacific R.R. Surv. v. 2).

Survey begun Apr. 4, 1854, and ended July 26, 1854.

Collections of Vertebrates were described in v. 10, (Serials no. 767 or 800), but are analysed below.

Repr. from (A), v. 2, pt. (2), Serial no. 737, q.v. above.

For history, route, etc., see above History: BECKWITH & GUNNISON'S EXPED.

CONTENTS:

p. 1- 95 BECKWITH, E. G. Report.

p. 96-111 SCHIEL, James. Geological report upon the country explored under the 38th and 41st parallels of north latitude, in 1853-54. 4 pl.

Also in (A), v. 2, Serial no. 737, pt. (2), p. 120-35.

- p. 111- 12 BAILEY, J. W. Letter upon infusorial fossils submitted by Dr. Schiel.

Written Dec. 14, 1854. Also in (A), v. 2, Serial no. 737, pt. (2), p. 135-36.

- p. 115- 32 TORREY, John and GRAY, Asa. . . . Report on the botany of the expedition. 10 pl. [74 fig.]

pt. 1 Plants collected by James A. Snyder, under the direction of Lt. E. G. Beckwith, in an expedition made under his charge from Great Salt Lake, Utah Territory, directly west to the Sacramento Valley, in California, in the months of May, June and July, 1854. p. 119-25.

pt. 2 Plants collected by Mr. F. Creutzfeld under the direction of Capt. J. W. Gunnison, in charge of explorations for a railroad from Fort Leavenworth, via the Kansas, Arkansas, & Huerfano Rivers, the Sangre de Cristo Pass, San Luis Valley, Coochetopa pass, and Green Rivers, and thence into the Great Basin, in the vicinity of the Sevier or Nicollet Lake—June-Oct. 1853. p. 125-31.

Papers in v. 10, Serial no. 767 or 800 Zoological Reports. Wash. 1857. 27 p. 18 pl.

CONTENTS:

- p. 7- 9 BAIRD, S. F. Report upon mammals collected on the survey . . . no. 1, p. 7-9, 3 pl.
 p. 11- 6 ————— Report on birds collected. . . 5 col. pl.
 p. 17-20 ————— Report on the reptiles collected. . . no. 3, p. 17-20, 4 pl.
 p. 21- 7 GIBARD, Charles. Report on the fishes collected. . . no 4, p. 21-7, 6 pl.
 Appx. Alphabetical index. (1) p.
 Report on Insects by J. L. Le Conte, never made.
 See his paper under v. 12

(3)

- 1856 LANDER, F[rederick] W[illiam]. Synopsis of a report of the Reconnaissance of a railroad route from Puget Sound via South Pass to the Mississippi River. Wash. 1856. 45 p. (Pacific RR. Surv. v. 2).

Rendered July 21, 1856.

(4)

- 1855 POPE, John. . . . Report of exploration of a route for the Pacific Railroad, near the thirty-second parallel of north latitude, from the Red River to the Rio Grande. Washington, 1855. [5] + 185 +

- 50 p. 10 pl. col. maps. sect. tab. 4°. (Pacific R.R. Surv. v. 2).
 Repr. from (A), v. 2, pt. (4), Serial no. 737. q.v. above.

CONTENTS:

- p. 1- 50 POPE, John. Report.
 p. 51- 93 BYRNE, J. H. Diary of the expedition.
 p. 94 BAIRD, S. F. Preliminary report on the natural history.
 p. 95- 7 BOOTH, J. C. Report on the soils and mineral waters.
 p. 98-156 Meteorological and astronomical observations.
 p. 157- 78 TORREY, John, and GRAY, Asa. . . . Report on the botany of the expedition. . . 10 pl. [93 fig.]
 50 p. BLAKE, W. P. . . . Report on the geology of the route near the thirty-second parallel: prepared from the collection and the notes of Capt. Pope. 50 p. col. map. sect. tab.

Written Dec. 1855.

(5)

- 1855 PARKE, John G[rubb]. Report of explorations for that portion of a railroad route, near the thirty-second parallel of north latitude, lying between Dona Ana, on the Rio Grande, and Pimas Villages, on the Gila. Washington, 1855. 28 p. (Pacific R.R. Surv. v. 2).

Rendered Aug. 22, 1854.

For cont. see v. 7, below.

For history and routes followed, see above History: PARKE'S EXPLORATIONS.

(6)

- 1855 EMORY, William Helmsley. . . . Report from report of a military reconnaissance, made in 1846 and 1847. Washington, 1855. 22 p. (Pacific R.R. Surv. v. 2).

Route near the 32d parallel of north latitude.

See EMORY RECONN. FORT LEAVENWORTH TO SAN DIEGO (1846)

(B), v. 3 & 4, Serials no. 760 & 761, or no. 793 & 794

- 1856 WHIPPLE, A[miel] W[EEKS], and IVES, J[oseph] C[hristmas]. . . . Report of explorations for a railway route, near the thirty-fifth parallel of north latitude from the Mississippi River to the Pacific Ocean; by Lt. A. W. Whipple, assisted by Lt. J. C. Ives. . . . 1853-54. Washington, 1856. 2 v. illus. pl. maps. 4°. (Pacific R.R. Surv. v. 3-4).

v. 3 pt. 1-4 8 + 136 + 77 + 127 + 119 p.

v. 4 pt. 5-6 7 + 193 + 17 + 288 p.

For personnel, history, route, etc., see above, History: WHIPPLE'S EXPLORATIONS.

Preliminary Report by Whipple also pub. in (A), v. 2, pt. (3), Serial no. 737, (above, q.v.)

CONTENTS:

- pt. 1 WHIPPLE, A. W. Itinerary: 1854. 8 + 136 p. pl.
 2 ——— Report on the topographical features of the country. Wash. 1856. 77 p.
 3 WHIPPLE, A. W., EWBANK, Thomas, and TURNER, W. W. Report upon the Indian tribes. Wash. 1855. 127 p. illus. pl.
 4 BLAKE, W. P. General report upon the geological collections. no. 1, 119 p. 3 pl.
 p. 99-119, ch. 9-10, HALL, James. Descriptions and notices of the fossils collected on the route. 2 pl. tab.
 MARCOU, Jules and BLAKE, W. P. Résumé and field notes; by Jules Marcou; with a translation and additional material by W. P. Blake.
 See also above, (A), v. 2, pt. (3), Serial no. 737, Whipple's Rept. p. 40-8.

(B), v. 4, Serial no. 761 or 794

Continuation of (B), v. 3

CONTENTS:

- pt. 5 Report on the Botany of the Expedition. 7 + 193 p. 59 pl.
 no. 1, BIGELOW, J. M. General description of the botanical character of the country. p. 1-16.
 Written Aug. 1854. See also (A), Serial no. 737, pt. (3), p. 54-71.
 no. 2, ——— Description of forest trees. p. 17-26, col. pl.
 See also (A), pt. (3), p. 71-81.
 no. 3, ENGELMANN, George, and BIGELOW, J. M. Description of the Cactaceae. p. 27-58, 24 pl. [180 fig.]
 Also in Repr. of E's Papers. 1887. p. 154-76.
 no. 4, TORREY, John. Description of the general botanical collections. p. 59-182, 25 pl. [179 fig.] Preface written Jan. 12, 1857. p. 95-9, 117-22, by Asa GRAY.
 no. 5, SULLIVANT, W. S. Description of the Mosses and liverworts. p. 185-93, 10 pl. [162 fig.]
 pt. 6 Report on the Zoology of the Expedition. Wash. 1856. 17 p. (Incl. only no. 1)
 no. 1, KENNERLY, C. B. R. Field notes and explanations. 17 p.
 pt. 6, no. 2-5, in v. 10, Wash. 1859. 64 p. 34 pl.
 no. 2, ——— Report upon the Mammals of the Survey-route. v. 10, p. 11-8, 6 pl.
 See above (A), v. 2, pt. (3), p. 48-54.

- no. 3, ——— Report upon the birds of the route.
v. 10, p. 19-35, 11 col. pl.
no. 4, BAIRD, S. F. Report upon the reptiles of the route.
v. 10, p. 37-45, 3 pl.
no. 5, GIRARD, Charles. Report upon the fishes of the
route. v. 10, p. 47-59, 14 pl.
Alphabetical index. p. 61-4.

APPENDIX to v. 4. Meteorological and astronomical observations.
288 p.

See also (A), v. 2, pt. (3), p. 135-306.

Papers in Society Transactions on Whipple's Exped.

- 1854 BAIRD, S. F. Descriptions of new birds collected between Albuquerque, N. M., and San Francisco, Cal., during the winter of 1853-54, by Dr. C. B. R. Kennerly and H. B. Mollhausen . . . attached to the Whipple Survey . . .

Rd before Phila. Acad. Nat. Sc. (1812), June 20, 1854. In its Proc. v. 7, p. 118-20.

GIRARD, Charles. Enumeration of the species of marine fishes collected at San Francisco by C. B. R. Kennerly . . .

Rd before Phila. Acad. Nat. Sc. (1812), Aug. 15, 1854. In its Proc. v. 7, p. 141-42.

- 1856 ENGELMANN, George. Synopsis of the Cactaceae of the territory of the United States and the adjacent regions . . . and corrections and additions . . .

Rd before Amer. Acad. A. & Sc. (1780), May 27 & Dec. 9, 1856. In its Proc. v. 3, p. 259-314, 345-46. See also paper rd before Acad. Sc. St. Louis (1856), Mar. 17, 1862. In its Trans. v. 2, p. 197-204.

- 1858 MARCOU, Jules. Geology of the Rocky Mountains . . . notes to accompany a geological description of the Rocky Mountains.

In Mining Mag. (1853), v. 11, p. 98-106. Aug. 1858.

(B), v. 5, Serial no. 762 or 795

- 1856 WILLIAMSON, R[obert] S[tockton]. . . Report of explorations in California for railroad routes to connect with the routes near the 35th and 32d parallels of north latitude: 1853 . . . Washington, 1856-57. 8 + 43 + 370 + 16 + 15 + 15 p. illus. pl. tab. sect. diagr. 4°. (Pacific RR. Surv. v. 5).

Was originally intended to be included in (A), v. 3, Serial no. 738 (never pub.)

Rev. in Amer. J. Sc. v. 71 (ser. 2, v. 21), p. 268-75. Mar. 1856; & v. 76 (ser. 2, v. 26), p. 122-23. July, 1858.

For history, personnel, route, etc., see above, History: WILLIAMSON'S EXPEDITION.

CONTENTS:

- pt. 1 WILLIAMSON, R. S. Report. Wash. 1855. 43 p.
pt. 2 BLAKE, W. P. Geological report. Wash. 1857. 16 + 370 + 13 p. illus. pl. maps.

Separate ed. pub. in 1858 by Blake is noted below under PAPERS IN SOCIETY TRANSACTIONS: 1858 (q.v.)

CONTENTS:

- no. 1 BLAKE, W. P. Itinerary; or, Notes and general observations upon the geology of the route. ch. 1-10, p. 1-130, illus. 14 pl. sect. 4 maps.
- no. 2 ——— Geology of portions of the route. ch. 11-20, p. 131-310. illus. pl. sect. maps.
- appx. AGASSIZ, Louis. Notice of the fossil fishes. art. 1, p. 313-16, 1 pl. [44 fig.]
 CONRAD, T. A. Descriptions of the fossil shells. art. 2, p. 317-29, 8 pl. [83 fig.] Written Jan. 1855.
 GOULD, A. A. Catalogue of the recent shells, with descriptions of the new species. art. 3, p. 330-36, 1 pl. [29 fig.]
 BAILEY, J. W. Letter describing the structure of the fossil plant from Posuncula River. art. 4, p. 337. Written Mar. 22, 1855.
 SCHAEFFER, G. C. Description of the structure of the fossil wood from the Colorado desert. art. 5, p. 338-39, 1 pl. [4 fig.]
 EASTER, J. D. Chemical examinations of soils and incrustations. art. 6, p. 340-43.
 BLAKE, W. P. Catalogue of the geological collection, with descriptions of several of the specimens. art. 6, p. 344-58.
 TORREY, John. Description of the plants collected along the route, by [W. P. Blake], and at the mouth of the Gila. art. 7, p. 359-70, 10 pl. [66 fig.] Written May 1, 1857.
- pt. 3 DURAND, Elias, and HILGARD, T. C. Botanical report: description of plants collected upon the expedition. Wash. 1855. 15 p. 18 pl.
 Written in 1854.
 Pt. 4 is in v. 10, Serial no. 767 or 800.
- pt. 4 HEERMANN, A. L., and others. Zoological report. Wash. 1859. 8+97 p. 26 pl. (In v. 10)
 Introd. letter, by Heermann, pref. p. 8.

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- no. 1 HALLOWELL, Edward. Report upon the reptiles collected on the Survey. p. 1-27, 9 pl.
 p. 24-5 List of reptiles collected, by A. L. HEERMANN.
- no. 2 HEERMANN, A. L. Report upon the birds collected on the survey. p. 29-80, 7 col. pl.

- no. 3 BAIRD, S. F. Report upon the Mammals collected on the Survey. p. 81-2.
 no. 4 GIRARD, Charles. Report on the fishes collected on the survey. p. 83-91, 10 pl.
 Alphabetical index, p. 94-7.

Appx. Surveying and astronomical data. 14 p.

Papers in Society Transactions

- 1854 GIRARD, Charles. Descriptions of new fishes, collected by Dr. A. L. Heermann, naturalist attached to the Williamson Expedition of the Pacific Railroad Survey
 Rd before Phila. Acad. Nat. Sc. (1812), Aug. 1, 1854. In its Proc. v. 7, p. 129-40.
- DURAND, Ehas, and HILGARD, T. C. *Plantae Heermannianae*: Descriptions of plants collected in South California by Dr A. L. Heermann, attached to Lt. Williamson's Expedition . . . with remarks on other plants heretofore described belonging to the same collection.
 Rd before Phila. Acad. Nat. Sc. (1812), Oct. 17, 1854. In its Jour. n. s. v. 3, p. 37-46. May, 1855.
- 1855 BLAKE, W. P. Notice of the remarkable strata containing the remains of Infusoria and Polythemia in the Tertiary formation of Monterey, Cal.
 Rd before Phila. Acad. Nat. Sc. (1812), April 24, 1855. In its Proc. v. 7, p. 328-31.
- Observations on the extent of the gold region of California and Oregon, with notices of mineral localities, and of some remarkable specimens of crystalline gold.
 In Amer. J. Sc. (1818), v. 70, (ser. 2, v. 20), p. 72-85. July, 1855.
 Repr. in Mining Mag. (1853), v. 5, p. 32-45. July, 1855.
- Remarks upon the geology of California, from observations in connection with the U. S. Surveys for a railroad route to the Pacific.
 Rd before Amer. Assoc. Adv. Sc. (1848), Aug. 1855. In its Proc. v. 9, p. 222-25.
- On the grooving and polishing of hard rocks and minerals by dry sand.
 In Amer. J. Sc. (1818), v. 70, (ser. 2, v. 20), p. 178-81. Sept. 1855. Also rd before Amer. Assoc. Adv. Sc. (1848), Aug. 1855. In its Proc. v. 9, p. 216-20. 1856.
- 1856 — On the rate of evaporation on the Tulare Lakes of California.
 In Amer. J. Sc. (1818), v. 71 (ser. 2, v. 21), p. 365-68. May, 1856. Also rd before Nat. Inst. Prom. Sc. (1840), March 4, 1856.
- Observations on the orography of the western portion of the United States.
 Rd before Amer. Assoc. Adv. Sc. (1848), in Aug. 1856. In its Proc. v. 10 (pt. 2), p. 119-34. 1857.

- 1858 ——— Report of a geological reconnaissance in California; made in connection with the expedition to survey routes in California, to connect with the surveys for a railroad route from the Mississippi River to the Pacific Ocean under the command of Lt. R. S. Williamson . . . in 1853, by W. P. Blake, geologist and mineralogist of the expedition; with an appendix containing descriptions of portions of the collections by Prof. Louis Agassiz, A. A. Gould, J. W. Bailey, T. A. Conrad, John Torrey, G. C. Schaeffer, J. D. Easter. N. Y., H. Bailliere, 1858. 16 + 370 + 13 p. 14 pl. 14 sect., 5 maps, 80 illus., & 22 pl. 4°.

A repr. of v. 5, as given above, except for Williamson's Report. For contents: see above.

- 1859 LE CONTE, J. L. The Coleoptera of Kansas and eastern New Mexico. In Smith. Inst. (1846). Contributions to Knowledge. v. 11, art. 6, 6 + 58 p. 2 pl. Dec. 1859.

(B), v. 6, (Serial no. 763 or 796)

- 1857 ABBOT, Henry L[arcom], and WILLIAMSON, R[obert] S[tockton]. Report of Lt. Henry L. Abbot, upon explorations for a railroad route, from the Sacramento Valley to the Columbia River, made by Lieut. R. S. Williamson, assisted by Lt. Henry L. Abbot: 1855. Washington, 1857. 134 + 85 + 102 + 114 + 64 p. illus. pl. maps. 4°. (Pacific RR. Surv. v. 6)

Rendered May 6, 1857. Rev. in Amer. J. Sc. v. 76, (ser. 2, v. 26), p. 123-26. July, 1858.

For personnel, route, history, etc., see above, History: WILLIAMSON & ABBOT'S EXPEDITION.

CONTENTS:

- pt. 1 ABBOT, H. L. Introduction. p. 1-15.
 ——— General report —. (narratives and journals). p. 17-134, illus. pl. sect. prof. maps. Wash. 1857.
- pt. 2 NEWBERRY, J. S. Report upon the geology of the route. no. 1, ch. 1-8, p. 9-68, illus. pl. Wash. 1856.
 CONRAD, T. A. Description of the Tertiary fossils collected on the survey. no. 2, p. 69-73, 4 pl. [25 fig.]
 HORSFORD, E. N., and DORNBACH, L. M. Report upon an analytical examination of water in minerals from the Hot Springs in Des Chutes Valley. no. 3, p. 74-8.
 NEWBERRY, J. S. Catalogue of the minerals and fossils collected on the survey. no. 4, p. 79-85.
- pt. 3 Botanical Report. Wash. 1857. 102 p. 16 pl. 28 illus.
 ——— Report on botany. . . no. 1, p. 9-64, 10 pl.
 NEWBERRY, J. S., GRAY, Asa, and TORREY, John. General catalogue of the plants collected on the expedition. no. 2, p. 65-102, 6 pl.
 p. 90- 3 Endogenous plants, by TORREY.
 p. 93- 4 Mosses and liverworts, by W. S. SULLIVANT.

- p. 94 Lichens, by Edward TUCKERMAN.
 p. 76- 9 Compositae, by GRAY.
 p. 80- 3 Scrophulariaceae, by GRAY.
- pt. 4 Zoological Report. Wash. 1857. 114+4 p. illus. 16 pl.
 GIRARD, Charles. Report upon fishes collected on the survey. no. 1, p. 9-34, 11 pl.
 NEWBERRY, J. S., and BAIRD, S. F. Report upon the zoology of the route. no. 2, p. 35-110, 5 pl.
 ch. 1, p. 35- 72, Mammals
 2, p. 73-110, Birds
- BINNEY, W. G. Report upon the land shells collected on the survey. no. 3, p. 111-14.
- pt. 4, no. 4, in v. 10, Serial no. 767 or 800.
 BAIRD, S. F. Report on reptiles collected on the survey. v. 10, no. 4, p. 9-13, 4 pl.
- Appendixes. Surveying and meteorological observations. 64 p.

Paper in Society Transactions

- 1858 MEEK, F. B. Descriptions of new organic remains from the Cretaceous rocks of Vancouver's Islands.

Rd before Albany Inst. (1824), in 1858. In its Trans. v. 4, p. 37-49. 1858.

(B), v. 7, (Serial no. 764 or 797)

(1)

- 1857 PARKE, John G[ruhb], and CAMPBELL, Albert H. . . . Report of explorations for railroad routes from the San Francisco Bay to Los Angeles, California, west of the coast range, and from the Pimas villages on the Gila to the Rio Grande, near the 32d parallel of north latitude: 1854-55. Washington, 1857. 427 p. (42+204+28+116+37 p.) illus. pl. sect. diagr. tab. maps. 4°. (Pacific RR. Surv. v. 7).

Report rendered Feb. 9, 1857.

For history, personnel, route, etc., see above, History: PARKE'S EXPLORATIONS.

Rev. in Amer. J. Sc. v. 76, (ser. 2, v. 26), p. 126-27. July, 1858.

CONTENTS:

- pt. 1 PARKE, J. G. General report. . . Wash. 1857. 42 p. 8 pl. prof. 2 maps.
 no. 1, p. 1-18 Report of explorations from San Francisco Bay to Los Angeles.
 no. 2, p. 19-42 Report of explorations from Pimas Villages to the Rio Grande.
- pt. 2 Geological Report.
 ANTISELL, Thomas. . . . Geological report. Wash. 1856. 204 p. 10 pl. [59 fig.] 14 sect. 2 maps.

- p. 187-96, ch. 29 CONRAD, T. A. Report on the palaeontology of the survey. 8 pl. [46 fig.]
- pt. 3 Botanical Report. Wash. 1857. 28 p. 8 pl.
 TORREY, John. List and description of the plants collected; with descriptions of plates. ch. 1 & 3, p. 7-22, 27-8, 8 pl [60 fig.]
 ANTISELL, Thomas. Synoptical tables of botanical localities. ch. 2, p. 23-6.
- pt. 4 Zoological Report, in v. 10. Serial no. 767 or 800. Wash. 1859. 24 p. 4 pl.
 HEERMANN, A. L. Report upon the birds collected on the survey. v. 10, no. 1, p. 9-21, 3 pl.
 HALLOWELL, Edward. Report upon the reptiles collected on the survey. v. 10, no. 2, p. 23-4, 1 pl.
- Appendixes. Meteorological and astronomical and surveying observations. 116 p.
 p. 15-28, Appx. B.: POOLE, Charles H. Report upon the route from San Diego to Fort Yuma, via San Diego River, Warner's Pass and San Felipe Canon.

(2)

- 1857 HUMPHREYS, Andrew Atkinson. Conclusion of the official review of the Reports upon the Explorations and Surveys for railroad routes from the Mississippi River to the Pacific Ocean: 1855-57. Wash. 1857. 37 p. (Pacific RR. Surv. v. 7).
 For first pt., see v. 1, (2), in (A), & (B).

(B), v. 8, Serial no. 765 or 798

Mammals

- 1857 BAIRD, Spencer Fullerton. . . . General report upon the zoology of the several Pacific railroad routes . . . part 1: Mammals by S. F. Baird. Washington, 1857. 48+757 p. 60 pl. [175 fig.] 35 illus. 4°. (Pacific RR. Surv. v. 8).
 Report rendered July 20, 1857.
 See above, History: ZOOLOGICAL COLLECTIONS.
 Report rev. in Amer. J. Sc. v. 76, (ser. 2, v. 26), p. 142-45. July, 1858.

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Papers in Society Transactions

- 1855 BAIRD, S. F. Characteristics of some new species of North American Mammalia collected chiefly in connection with the Pacific Railroad Surveys.

Rd before Phila. Acad. Nat. Sc. (1812), Apr. 24, 1855. In its Proc. v. 7, p. 333-36.

(B), v. 9, Serial no. 766 or 799

Birds

- 1858 BAIRD, Spencer Fullerton, CASSIN, John, and LAWRENCE, George Newbold. . . . General report upon the Zoology of the several Pacific railroad routes . . . part 2: Birds, by S. F. Baird, with the co-operation of John Cassin and G. N. Lawrence . . . Washington, 1858. 56 + 1005 p. 4°. (Pacific RR. Surv. v. 9).

Parts contributed by Cassin covers, p. 4-64, 689-753, 900-18.

Part contributed by Lawrence, p. 820-900.

See also HISTORY: ZOOLOGICAL COLLECTIONS, above.

Another edition, pub. in 1860, included an atlas of 100 col. pl. issued separately and bound with the text, entitled: The Birds of North America; the descriptions of species based chiefly on the collections in the Museum of the Smithsonian Institution, by Spencer F. Baird . . . with the cooperation of John Cassin . . . and George N. Lawrence . . . with an atlas of one hundred plates . . . text. Phila. J. B. Lippincott & Co., 1860. [iii]-xv, [xvii]-lvi, 1005 p. + xv p. 100 col. pl. (atlas).

Preface [vii]-xii, contains explanations of the plates, with notes.

Preface dated Oct. 20, 1858, instead of 1853, as in the original edition. The preface in some places is worded differently in the two editions.

See also COUES (1), pt. 1, p. 649-51.

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Paper in Society Transactions

- 1859 BAIRD, S. F. Catalogue of North American birds chiefly in the Museum of the Smithsonian Institution.

In Smith. Inst. (1846). Misc. Coll. v. 2, art. 4, 22 p. 1859.

(B), v. 10, Serial no. 767, or 800

(1) *Fishes & Reptiles &*

(2) *Zoological Reports of Individual Expeditions*

(1)

- 1859 BAIRD, Spencer Fullerton, and GIRARD, Charles. General report upon the zoology of the several Pacific railroad routes: part 3-4: Reptiles by S. F. Baird . . . Fishes by Charles Girard . . . Washington, 1859. 16 + 14 + 400 p. 13 + 21 pl. 4°. (Pacific R.R. Surv. v. 10).

See also above, History: ZOOLOGICAL COLLECTIONS.

Pt. 4, rev. in Amer. J. Sc. v. 80, (ser. 2, v. 30), p. 277-81. Sept. 1860.

CONTENTS:

- pt. 3 BAIRD, S. F. . . . Reptiles. Wash. 1859. 16 p. 13 pl. [123 fig.]

For lack of room descriptive text was omitted and only the plates printed.

- pt. 4 GIRARD, Charles. . . . Fishes. . . . Wash. 1858. 14 + 400 p. 21 pl.

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(2)

*Zoological Reports of the Various Individual Expeditions Are
Included as Follows:*

GUNNISON & BECKWITH. Wash. 1857. no. 1-5. 27 + (1) p.
(see v. 2).

WHIPPLE. Wash. 1859. pt. 6, no. 2-5. 64 p. 34 pl. (see v.
3-4).

PARKE. Wash. 1859. pt. 4, no. 1-2, 24 p. 4 pl. (see v. 7).

WILLIAMSON. Wash. 1859. pt. 4, no. 1-4, 97 p. 26 pl. (see
v. 5).

WILLIAMSON & ABBOT. Wash. 1859. pt. 4, no. 4, 13 p. (see
v. 6).

(B), v. 11, Serial no. 768 or 801

- 1859 WARREN, Gouverneur K[emblem]. . . . Memoir to accompany the map of the territory of the United States from the Mississippi River to the Pacific Ocean, giving a brief account of each of the exploring expeditions since A. D. 1800, with a detailed description of the method adopted in compiling the general map . . . Washington, 1859. 120 + 4 p. pl. sect. fold. map. 4°. (Pacific R.R. Surv. v. 11).

Rendered March 1, 1858.

An epitome of this Memoir is (In U. S. Geogr. Surv. West of 100th Meridian. Wash. 1889. appx. F, p. 513-97): WHEELER, G. M. Memoir upon the voyages, discoveries . . . to and at the west coast of America. . . . 1500 and 1880. See ANNOTATED BIBLIOGRAPHY: Wheeler.

See also above, History: WARREN'S MEMOIR.

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- p. 17- 30, ch. 1, Explorations from 1800-1832
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- p. 46- 65, ch. 3, “ “ 1843-1852
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 p. 110- 15, ch. 6, General remarks upon the topography of the
 region west of the Mississippi River.
 p. 116- 20 Alphabetical index.
 Appx. 4 p. Topographical maps, profiles, and sketches to illu-
 strate the various reports of surveys for railroad routes from the
 Mississippi River to the Pacific Ocean. Wash. 1859. 4 p.

(B), v. 12, Serial no. 992 or 1054 & 1055

Supplementary to v. 1 (q.v.)

(1) Senate ed., 992

- 1859 STEVENS, I[saac] I[ngalls]. . . . Supplementary report of ex-
 plorations for a route for a Pacific Railroad near the forty-seventh
 and forty-ninth parallels of north latitude, from St. Paul to Puget
 Sound: 1853-55. Washington, 1859. 15 + 333 + 8 + 72 + 8 + 399 + 28
 p. illus. 123 pl. maps, tab. 4°. (Pacific RR. Surv. v. 12).
 In U. S. 35th Cong., 2d sess., Sen. Ex. Doc. v. 18, no. 46. Serial
 no. 992.
 (This Senate ed. of v. 12 is in one volume.)

(2) House ed., 1054 & 1055

- 1860 ————. Narrative and final report of explorations for a route
 for a Pacific Railroad, near the forty-seventh and forty-ninth paral-
 lels of north latitude, from St. Paul to Puget Sound: 1853-55.
 Washington, May 1860. 2 v. illus. pl. maps. 4°. (Pacific RR.
 Surv. v. 12, 2 parts).
 In U. S. 36th Cong., 1st sess., H. Ex. Doc. v. 11, pt. 1 & 2, no.
 56. Serial no. 1054 & 1055.
 (This House ed. of v. 12 is in two volumes.)
 v. 1, pt. 1, 358 + 41 p. 70 col. pl. 2 maps prof. (Serial no.
 1054)
 v. 2, pt. 2-3, 76 + viii, [1], + 399 p. 6 + 47 pl. (Serial no. 1055)
 In House ed., v. 1: Narrative; v. 2, Scientific.
 For history, personnel, route, etc., see above, History: STEVENS'
 EXPEDITIONS.
 For Stevens' Preliminary Report, see (B), v. 1, above, or (A), v.
 1, (5), Serial no. 736.
 In analyzing the contents below, the paginations of the Senate ed.
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 an indicator.
 Pts. 2 & 3 were repr. in separate ed. by Messrs. Cooper & Suckley.
 See below, PAPERS IN SOCIETY TRANSACTIONS: 1859.

CONTENTS:

- pt. 1 STEVENS, I. I. General report and narrative. Wash. 1859.
 15 + 333 + 8 p. 70 pl. maps.
 In Serial no. 1054 (H ed.). Wash. 1860. 358 + 41 p.
- p. 21-171 Narrative of 1853.
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- pt. 2 Botanical Report. Wash. 1859. 72 p. 6 pl. [40 fig.]
 (Serial 992.)
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 (H. ed)

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- no. 1, p. 9-35 COOPER, J. G. Report of the botany of the
 route.
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- no. 2, p. 36-45 GRAY, Asa. Catalogue of plants collected
 east of the Rocky Mountains.
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- no. 3, p. 46-67 COOPER, J. G. Catalogue of plants collected
 in Washington Territory. 6 pl. [40 fig.]
 Note by Samuel ASHMEAD, p. 67.
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 Ashmead, p. 71.
- pt. 3 Zoological Report. Wash. 1859. 8 + 399 p. 47 pl. (Serial
 992.)
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- no. 2, p. 73- 88 COOPER, J. G. Report upon the mammals collected on the survey. ch. 1.
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 no. 3, p. 140-226 COOPER J. G. Report upon the birds collected on the survey: land birds. ch. 1. 1 pl.
 p. 227- 91 SUCKLEY, George. Water birds. ch. 2.
 no. 4, p. 292-306 COOPER, J. G. Report upon the reptiles collected on the survey. 11 pl.
 no. 5, p. 307- 68 SUCKLEY, George. Report upon the fishes collected on the survey. . . . 20 pl.
 ch. 1 Salmonidae, p. 307-49.
 2 Exclusive of S., p. 350-68.
 no. 6, p. 369- 86 COOPER, William. Report upon the Mollusca collected on the survey.
 no. 7, p. 387- 89 COOPER, J. G. Report on the Crustacea collected on the survey.
 p. 391- 99 Index to zoological report.
 appx. 28 p. Meteorological etc. (Not in H. Ed.)
 p. 27-8 Letter accompanying reports of Messrs. Cooper and Suckley. Feb. 3, 1859.

Papers in Society Transactions

- 1854 LE CONTE, J. L. Descriptions of some new Coleoptera from Oregon collected by Dr. J. G. Cooper, of the N. Pacific Railroad Expedition under Stevens. . . .
 Rd before Phila. Acad. Nat. Sc. (1812), Feb. 21, 1854. In its Proc. v. 7, p. 16-20.
 EVANS, John, and SHUMARD, B. F. Description of new fossil species from the Cretaceous formation of Sage Creek, Nebraska, collected by the North Pacific Railroad Expedition under Stevens. . . .
 Rd before Phila. Acad. Nat. Sc. (1812), June 20, 1854. In its Proc. v. 7, p. 163-64.
 ———. Descriptions of new fossil species from the fresh water Tertiary formation of Nebraska, collected by the expedition . . . under Stevens. . . .
 Rd before Phila. Acad. Nat. Sc. (1812), Aug. 1, 1854. In its Proc. v. 7, p. 164-65.
 1859 LECONTE, J. L. Additions to the coleopterous fauna of northern California and Oregon.
 Rd before Phila. Acad. Nat. Sc. (1812), Oct. 18, 1859. In its Proc. v. 11, p. 281-92. 1859.

SUCKLEY, G[eorge], and COOPER, J. G. Reports on the natural history, climate and physical geography of Minnesota, Nebraska, Washington, and Oregon Territories, made in connection with the survey of a Pacific Railroad route, along the forty-seventh and forty-ninth parallels of latitude in 1853-4-5-6, under the command of Governor I. I. Stevens of Washington Territory. N. Y. Bailliere Bros., 1859. 399 + 26 p. 65 pl. charts. 4°.

A repr. of pt. 2-3 of v. 12. Rev. in Amer. J. Sc. v. 80, (ser. 2, v. 30), p. 138-39. July, 1860.

———. The natural history of Washington Territory and Oregon, with much relating to Minnesota, Nebraska, Kansas, Utah and California, between the thirty-sixth and forty-ninth parallels of latitude . . . with full catalogues and descriptions of the plants and animals collected from 1853-60 . . . this edition contains a new preface . . . a classified table of contents and the latest additions and corrections by the authors . . . in two parts. N. Y. Bailliere Bros., 1859-60. 2 v. in 1, illus. 60 pl. (17 + 72 + 399 p.) 4°.

Pub. in ed. of 100 copies. A Repr. of pts. 2 & 3 of v. 12, see above: (B), v. 12: Contents. Rev. in Amer. J. Sc. v. 80 (ser. 2, v. 30), p. 138-39. July, 1860.

PAGE'S EXPLORATION OF THE LA PLATA RIVER (1853)

History

Captain Thomas J. Page was ordered on a cruise of the river La Plata and its tributaries, the Parana, Paraguay, Uruguay, and Vermejo Rivers early in 1853. He and his party cruised in the steamer "Water-Witch," which left Norfolk, Va., Feb. 8, 1853, and returned to the United States in 1856.

Dr. Robert Carter was the surgeon of the expedition and made the various collections. The specimens were submitted to members of the Philadelphia Academy of Natural Sciences, and described in their Proceedings, (see PAPERS IN SOCIETY TRANSACTIONS, below), by Messrs. Cope, Cassin, Girard, Carson. Page's Report was rendered Aug. 4, 1856, and published the same year in both a House and a Senate edition.

Report

(1) Senate ed., Serial no. 876

1856 PAGE, Thomas J[efferson]. Synoptical report . . . on the late "exploration and survey of the river La Plata and its tributaries." Washington, 1856. (In U. S. 34th Cong., 3d sess., Sen. Ex. Doc., v. 3, no. 5, p. 430-65). Serial no. 876.

(2) House ed., Serial no. 894

———. Same . . . Washington, 1856. (In U. S. 34th Cong., 3d sess., H. Ex. Doc., v. 1, no. 1, p. 430-65). Serial no. 894.

CONTENTS:

- p. 430-62 PAGE, T. J. Report.
- p. 463-64 CASSIN, John. The birds of the expedition.
- p. 464-65 GIRARD, Charles. The fishes. . . .
- p. 465 CARSON, C. On the collections.

Paper in Society Transactions

- 1862 CORE, E. D. Catalogue of the reptiles obtained during the explorations of the Parana, Paraguay, Vermejo and Uruguay Rivers, by Capt. T. J. Page; and those procured by Lt. N. Michler . . . conducting the survey of the Atrato River. . . .

Rd before Phila. Acad. Nat. Sc. (1812), Sept. 9, 1862. In its Proc. v. 14, p. 346-59.

See also Michler's Exped. to Isthmus of Darien (1857.)

RODGERS & RINGGOLD NORTH PACIFIC
EXPLORING EXPEDITION (1853)

History

"The North Pacific Exploring Expedition, as it is commonly called, has, next to the earlier expedition under Wilkes (see Wilkes U. S. Explor. Exped. (1838)), given more important zoological results than any similar explorations under the Navy Department. It sailed from the United States in June, 1853, and continued its work through 1854 and 1855, returning in 1856. The great value of its zoological results were due to the untiring zeal of its chief zoologist, Dr. William Stimpson, whose previous studies and explorations particularly fitted him for the position.

"This expedition was carried on under an appropriation from Congress in 1852, for 'building or purchase of suitable vessels, and for prosecuting a survey and reconnaissance, for naval and commercial purposes, of such parts of Bering Straits, of the North Pacific Ocean and the China Seas, as are frequented by American whale ships, and by trading vessels in their routes between the United States and China.'

"The necessary vessels were procured and equipped in the most substantial manner, and fitted out with all the instruments required for making observations in astronomy, hydrography, magne-

tism, and meteorology, together with the most complete equipment of natural history apparatus which had ever been taken to sea up to that time. Captain C[adwallader] Ringgold, who had formerly been connected with the United States Exploring Expedition under Captain Wilkes, was placed in command; but, being recalled to the United States, in 1854, he was superseded by Captain John Rodgers. The squadron was organized as follows: Sloop 'Vincennes,' bearing the flag of Commander Ringgold; Lieut. Rolando, commanding and executive officer; Lieut. J. M. Brooks, assistant astronomer; William Stimpson, zoologist to the expedition; F. H. Storer, chemist and taxidermist; Edward M. Kern, photographer and artist; steamer "John Hancock," Lieut. John Rodgers, commanding; Charles Wright, botanist to the expedition; A. H. Ames, assistant naturalist to the expedition; brig 'Porpoise,' Lieut. Alonzo B. Davis, commanding; schooner, 'Fenimore Cooper,' Acting-Lieut. H. R. Stevens, commanding; storeship, 'John R. Kennedy,' Lieut. Napoleon Collins, commanding.

"The vessels left Norfolk in June, 1853, and after touching at the Island of Madeira, proceeded to Hong Kong, China, via the Cape of Good Hope. On this passage, the sloop 'Vincennes' and the brig 'Porpoise' passed by the way of Van Diemen's Land, through the Coral Seas, and by the Caroline, Ladrone and Bashee Islands, and the steamer 'John Hancock,' the storeship and the tender, by way of the Straits of Sunda and Gaspar, the Carimata and Billeton passages, and the Sooloo Sea. The existence of a civil war in China at the time of the arrival of the expedition at Hong Kong, occasioned some delay in the progress of the exploring work, which was again resumed in the latter part of 1854.

"Subsequently the expedition proceeded northward, continuing the observations and collecting along the coasts of Japan, and Kamschatka, in Bering Straits, on the coast of California, and at Tahiti, from which latter place it turned directly home by way of the Cape of Good Hope. The natural history results were of great magnitude, filling many boxes and barrels, and embracing very many new and rare species. The extent and value of the zoological collections may be judged from the following number of species of each group obtained:

Vertebrates, 846; Insects, 400; Crustacea, 980; Annelids, 220; Mollusks, 2,359; Radiates, 406; total, 5,211.

"The plants in their original packages occupied a bulk of over 100 cubic feet. Soon after his return to the United States, Dr. Stimpson became the Director of the Chicago Academy of Sciences (1856), q.v., to which place nearly all of the invertebrate materials of the expedition were transferred. Considerable progress had been made in working up the results, and several short papers briefly descriptive of the more interesting groups of animals had been issued, when the memorable conflagration of 1871, which destroyed so large a part of Chicago, completely annihilated the entire collection there, as well as all of the MSS and the drawings which had been prepared for publication. The only collections of marine Invertebrates which escaped were the Corals and a few of the Crustacea, which had been left for study at the Smithsonian Institution, the Museum of Comparative Zoology, and at Yale College." RATHBUN, Richard. U. S. Nat. Mus. Bull. no. 27, p. 532-35. 1884. (In condensed form, in Smith. Inst. Misc. Coll. v. 49, Introd. 1907).

"The War has interfered with the completion of this Report, as the commander of the expedition, with several of his officers, are in active service on the Southern Coast and the appropriations for the department of natural science have ceased. The narrative by Capt. Rodgers has not yet been written. Many charts of portions of the Chinese and Japanese Seas, and also of parts of the N. E. Atlantic Coast to the Aleutian Islands are finished.

"The following reports on natural history are in progress: Zoology, by Wm. Stimpson, assisted by A. A. Gould, John Cassin, Dr. Edward Hallowell, Dr. P. R. Uhler, Mr. Barnard and Theodore Gill. The zoological portion will probably comprise about three volumes, quarto, with an atlas for each. A report on the botany, by Prof. Asa Gray and Charles Wright, is in progress." F. V. HAYDEN. Amer. J. Sc. v. 84 (ser. 2, v. 34), p. 98. July, 1862.

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WISCONSIN GEOLOGICAL SURVEYS (1853)

History

"Under the act passed by the Wisconsin legislature and approved March 25, 1853, Mr. Edward Daniels was appointed state geologist, but after the lapse of about a year, he was superseded by Dr. Percival, on August 12, 1854, who held the place to the time of his death in 1856."

"The Geological Survey having thus been left unfinished a new act was passed on March 3, 1857, providing for a geological and agricultural survey of the state—James Hall, Ezra S. Carr and Edward Daniels being appointed commissioners . . ." James HALL. Hist. Geol. Surv. Wisconsin (see Bibliography: 1862, below).

The three commissioners remained in joint control until April 2, 1860, when they were succeeded by Hall as superintendent. The Survey was discontinued in 1862, the legislature refusing to make further appropriations. (See MERRILL: 1920, under Bibliography below, for the differences and difficulties of the Survey during the regime of the Commissioners).

Daniels in 1853-54 was assisted by I. A. Lapham, A. A. Hayes and H. A. Tenney. They rendered a report in 1854. Dr. J. G. Percival's investigations yielded two reports.

Daniels in 1858 rendered a brief report as one of the Commissioners. Hall presented a report of progress for 1860, published in 1861.

Hall as superintendent engaged the services of J. D. Whitney, T. J. Hale and Charles Whittlesey. A joint report by Hall and Whitney appeared in 1862. Hall had another projected volume ready for the press during his incumbency but the legislature failed

to appropriate the necessary funds. A partial report appeared in 1871, (see REPORTS, below).

In 1863, John Murrish published a brief report on the lead regions. The expenses of the Daniels-Percival surveys were approximately \$7,500, according to Merrill; those from 1857-62, totaled \$36,000.

For critical notes on the various surveys, see MERRILL. First 100 yrs Amer. Geol. 1924. p. 319-21, 353-57.

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KENTUCKY GEOLOGICAL SURVEY (1854)

History

By virtue of the acts of the Kentucky Legislature passed on and approved March 4, 1854, March 7, 1856, and February 17, 1858, provision was made for the organization and the continuation of a Geological and Mineralogical Survey of the State of Kentucky.

David Dale Owen was appointed state geologist on April 26, 1854, and served throughout the life of the survey, which was suspended in 1860, due to the approaching Civil War. Owen was allowed by the terms of the original act to engage two assistants, and those selected were Robert Peter, chemist, and Sidney S. Lyon, topographer. Subsequently he engaged Leo Lesquereux, palaeobotanist, E. T. Cox, geologist, Joseph Lesley, topographer. In 1859, Lesquereux was assisted by Alfred Owen and T. C. Downie.

Owen and his scientific corps rendered four reports covering the six years of 1854-59, published as shown below under REPORTS (q. v.)

Peter received his appointment on May 2, 1854 and Lyon, his, on May 25, 1854. They submitted reports which were published in all four of the Survey Reports. Lesquereux's appeared in the third and fourth volumes; Cox's in the third; Joseph Lesley, Jr.'s in the fourth.

See also MERRILL, (1) p. 443-44, for a review of the geological contents of the Reports. See Bibliography: 1920: Merrill, below, for a comprehensive history of the state surveys prior to 1885, with reprints of the original acts. See also below PAPERS IN SOCIETY TRANSACTIONS. Below in the Bibliography are given papers relating to the geological survey of the state which were published in the Kentucky State Documents. See also HASSE, (2), Index Econ. Material Ky. Jan. 1910. p. 303-25, for a complete list. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 321-23.

According to Merrill, the state expended during the period of the survey, the sum of \$55,000.

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Rev. in Amer. J. Sc. v. 73 (ser. 2, v. 23), p. 272-76. Mar. 1857.

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- p. 5-248 OWEN, D. D. General report.
 p. 251-379 PETER, Robert. Chemical report of the minerals, rocks and soils. Written Sept. 24, 1855.
 p. 381-400 LYON, S. S. Topographical geological report of that portion of Kentucky including Union and part of Crittenden Counties, surveyed during the years 1854 and 1855.
 p. 401- 16 Index.

2nd

- 1857 ————. Second report of the geological survey in Kentucky made during the years 1856 and 1857, by David Dale Owen, principal geologist, assisted by Robert Peter, chemist, and S. S. Lyon, topographical assistant. Frankfort, Ky., A. G. Hodges, 1857. 391 p. illus. map. 4°.

Abstr. in Amer. J. Sc. v. 75 (ser. 2, v. 25), p. 283-84. Mar. 1858.

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- p. 5- 6 OWEN, D. D. Introductory letter.
 p. 7-114 ————. General geological report.
 p. 9- 27, 29-51, Agricultural geology, ch. 1 & 2.
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 p. 117-300 PETER, Robert. Second chemical report of the ores, rocks, soils, coals, mineral waters of Kentucky. Dec. 8, 1856.
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p. 465- 98 ———. Palaeontological report.
p. 499-556 LESQUEREUX, Leo. Palaeontological report of the fossil flora of the coal measures of the western Kentucky coal field. 2 pl. [14 fig.]
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- p. 3- 37 OWEN, D. D. Geological report.
p. 39-321 PETER, Robert. Fourth chemical report of the soils, marls, ores, rocks, coals, iron furnace products, mineral waters, etc. Written Feb. 4, 1860.
p. 331-437 LESQUEREUX, Leo. Report of the fossil flora and of the stratigraphical distribution of the coal in the Kentucky coal fields. 4 pl. sect.
Written Jan. 31, 1860. Assisted by Alfred OWEN, and T. C. DOWNIE.
p. 439- 94 LESLEY, Joseph, Jr. Topographical and geological report of the country along the outcrop base line following the western margin of the eastern coal-field . . .

from a survey during 1858-59. sect. Written Nov. 1, 1859.

p. 495-599 LYON, S. S. Topographical geological report . . . for the years 1858 and 1859.

p. 601- 16 Index.

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1857 OWEN, D. D. Geological report in relation to the soils of Kentucky.

In Mining Mag. (1853), v. 8, p. 424-34. May, 1857.

1860 LYON, S. S. Remarks on the stratigraphical arrangement of the rocks of Kentucky, from the Catenipora escharoides horizon of the Upper Silurian period, in Jefferson County, to the base of the productive coal measures in the eastern edge of Hancock County.

Rd before Acad. Sc. St. Louis (1856), May 21, 1860. In its Trans. v. 1, p. 612-21. 1860.

LYON, S. S., and CASSEDAY, S. A. Description of nine new species of Crinoidea from the subcarboniferous rocks of Indiana and Kentucky.

In Amer. J. Sc. (1818), v. 79 (ser. 2, v. 29), p. 68-79. Jan. 1860.

LYON, S. S. Descriptions of four new species of Blastoides, from the subcarboniferous rocks of Kentucky.

Rd before Acad. Sc. St. Louis (1856), May 21, 1860. In its Trans. v. 1, p. 628-34, 1 pl.

LESQUEREUX, Leo. On the formation of coal.

In Mining Mag. (1853), ser. 2, v. 1, p. 264-84. Feb. 1860.

1861 ———. Descriptions of new Palaeozoic fossils from Kentucky and Indiana.

Rd before Phila. Acad. Nat. Sc. (1812), Dec. 10, 1861. In its Proc. v. 13, p. 409-14, 1 pl.

MARCY'S EXPLORATION OF THE BIG WICHITA (1854)

History

In the summer of 1854, Capt. R. B. Marcy was ordered to conduct an expedition to the sources of the Brazos and the Big Wichita Rivers, in Texas, in connection with the locating of lands for the Indians of Texas.

He was accompanied by G. G. Shumard as geologist, surgeon and naturalist of the party. Marcy's Report was rendered Jan. 15, 1855, and was published early in 1856.

For details of the route followed, see WARREN, p. 85. W. P. Blake described the geological collections made by Shumard. W. B. Parker, a member of the expedition, published a volume in 1856 on the expedition (see Bibliography, below: 1856).

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- 1859 MARCY, Randolph B[arnes]. Erforschung des Quaellesgelietes das Big Wichita und Brazox im innern von Nord-America. 1859. (In Petermann. Mittheil. p. 36-41)

Report

- 1856 MARCY, Randolph B[arnes]. Report of an expedition to the sources of the Brazos and Big Wichita Rivers, during the summer of 1854. Washington, 1856. 48 p. map. (In U. S. 34th Cong., 1st sess., Sen. Ex. Doc. v. 12, no 60) Serial no. 821.

CONTENTS:

- p. 46-7 BLAKE, W. P. Notice of the geological collection.
- p. 48 SEUMARD, G. G. Catalogue of the geological collection made by . . . near Fort Belknap, Texas.

POTTSVILLE SCIENTIFIC ASSOCIATION OF SCHUYLKILL
COUNTY, POTTSVILLE, PA. (1854)

History

The Pottsville Scientific Association of Schuylkill County, Pennsylvania, was organized on the 10th of October, 1854. The object of the Association was "to be devoted to the development of the scientific interests generally; but particularly in relation to those branches of knowledge usually denominated natural science."

The officers for 1855 as published in its Bulletin were James S. Carpenter, president; Samuel Lewis, vice-president; A. Heger and Peter W. Sheaffer, curators; chairmen of natural history committees, Samuel Lewis, geology; Joseph H. Wythes, palaeontology; Thomas W. Yardley, mineralogy; John H. Adam, conchology. C. Little was also an active member.

"The effort proved successful for about ten years, during which time a valuable scientific library was accumulated, together with a large collection of minerals and curios. On the dissolution of the Society, the mineral cabinet was presented to Lafayette College, and the library was placed in charge of the Pottsville Athanaeum." From History of Schuylkill Co., Pa. ed., by A. W. Schalck & D. C. Henning. 1907. p. 179.

Below are given a list of the papers on natural history to be found in its Bulletin or published as separates.

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Copy examined at the Library of Congress.

Papers on Natural History

- 1855 *DESOR, Edward. The falls of Niagara and their retrograde movement. Bull. p. 5-10, charts. Rd Feb. 17.

Transl. from Bull. of Acad. Sc. Neuchatel. v. 3, p. 166-71. 1853.

LEWIS, Samuel. A few remarks on the greensand formation of New Jersey. Bull. p. 11-3. Rd Mar. 10.

———. The cause of certain markings in coal. Bull. p. 14. Rd Mar. 24.

WARREN, John. Studies in organic morphology. Phila. 1857. 58 p. (Rd in 1855.)

Rev. in Amer. J. Sc. v. 74 (ser. 2, v. 24), p. 443-44, illus. Nov. 1857.

- 1858 SHEAFER, P. W. Coals and collieries of Schuylkill County, Pa. Rd June 19.

In Mining Mag. (1853), v. 11, p. 19-26. July, 1858.

LESQUEREUX, Leo. The fossil plants of the coal measures of the United States, with descriptions of the new species in the Cabinet of the Pottsville Scientific Association, Pa. 1858. Pottsville, Pa., 1858. 24 p. pl. Rd Feb. 13.

Includes on p. 24, Impressions of vegetables on coal, by Samuel LEWIS.

Paper rev. in Amer. J. Sc. v. 76 (ser. 2, v. 26), p. 112-13. 1858.

IOWA GEOLOGICAL SURVEY (1855)

History

The Geological Survey of Iowa was organized by legislative enactment, approved January 23, 1855, by which James Hall was appointed state geologist for a period of two years. At the expiration of this period Hall was granted a further appropriation and the work on the survey continued through 1858.

At the close of 1856, Hall rendered a brief report of progress, and submitted a Final Report in two volumes, November, 1857,

which was published the following year. J. D. Whitney was selected by Hall as chemist and mineralogist; A. H. Worthen, F. B. Meek, J. B. Hall, E. Hungerford, Edwin A. Cooley and R. P. Whitfield served in various capacities. The survey was discontinued in 1859. According to MERRILL (see Bibliography: 1920, below) about \$15,000 was expended during the period of the survey.

See also MERRILL (1), p. 465-69, for a critical review of the contents of the report of the survey. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 345-50.

See below PAPERS IN SOCIETY TRANSACTIONS, that of 1856, being Hall's progress report referred to, above.

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- 1893 KEYES, Charles Rollin. Bibliography of Iowa geology. Des Moines, 1893. (In Iowa Geol. Surv. 1st Ann. Rept. for 1892. v. 1, p. 209-472)

Dictionary arrangement of entries. Later ed., see, below, 1913.

- 1906 ANDERSON, Rudolph Martin. The birds of Iowa. Davenport, Iowa, July 24, 1906. (In Davenport Acad. Sc. Proc. v. 11, p. 125-417, illus. map.)

Historical work, p. 128-31. Bibliography, chronologically arranged, p. 393-403.

- 1913 KEYES, Charles [Rollin]. . . . Annotated bibliography of Iowa geology and mining. Des Moines, Pub. for Iowa Geol. Surv., 1913. 908 p. (In Iowa Geol. Surv. v. 22)

CONTENTS:

p. 15- 44, ch. 1, Geographical explorations of Iowa-land.

p. 45- 88, ch. 2, Geologic reconnaissance.

p. 89-121, ch. 3, Historical sketch of mining.

p. 123- 55, ch. 4, Systematic geological surveying.

Contains also Bibliography of the contents of the Publications of the Survey.

p. 157-908 Annotated bibliography.

Dictionary arrangement of authors, subjects & titles.
(See previous edition, above, under 1893.)

- 1919 ————. A century of Iowa geology. Des Moines, Iowa, 1919. (In Iowa Acad. Science. Proc. for 1919. v. 26, p. [407]-40, 13 port.)

Historical resumé of the various individual contributions.

- 1920 MERRILL, George P[erkins], ed. Iowa Geological Surveys. Washington, 1920. (In U. S. Nat. Mus. Bull. no. 109. p. 85-97, port.)

History of surveys prior to 1885.

Reports

- 1856 HALL, James. Progress report . . .

See below PAPERS IN SOCIETY TRANSACTIONS: 1856.

- 1858 HALL, James, and WHITNEY, J[osiah] D[wight]. Report on the Geological Survey of the State of Iowa; embracing the results of investigations made during portions of the years 1855, 56, and 57 . . . Burlington, Iowa, Pub. by authority of the Legislature of Iowa, 1858. 1 v. in 2 pts. illus. 29 pl. [241 fig.] 3 maps. 4°.

Pt. 1, Geology. 15+ [1]+1-472.

2, Palaeontology, 473-724+4+30 p.

Preface dated Nov. 1857. Presented to printer, Sept. 1858.

Report rev. in Amer. J. Sc. v. 77 (ser. 2, v. 27), p. 103-17. Jan. 1859.

CONTENTS:

Part 1: Geology

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| pref. p. 5- 7 | HALL, James. Address to the Hon. Ralph P. Lowe. |
| pref. p. 9-10 | ———. Address to the Hon. James W. Grimes. |
| pref. p. 11- 5 | ———. Organization of the survey. |
| p. 1- 34, ch. 1, | WHITNEY, J. D. Physical geography. |
| p. 35- 44, 2, | HALL, James. General geology: General remarks on the geology of the northwest, and the relations of the formations of those of the east. |
| p. 45-146, 3, | ———. Geology of Iowa: general reconnaissance. illus. |
| p. 147- 82, 4, | WORTHEN, A. H. Geology of the Des Moines Valley. illus. Report made Dec. 1856. |
| p. 183-258, 5, | ———. Geology of certain counties: report for the year 1857; embracing the results of an examination in the counties of Lee, Des Moines, Henry, Van Buren, Jefferson, Washington, and Wapello. illus. Made Nov. 1857. |
| p. 259-323, 6, | WHITNEY, J. D. County geology continued: central and northern counties of the eastern half of the state. |
| p. 324-472 7, | ———. Chemistry and economical geology. illus. |

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 Rd before Amer. Assoc. Adv. Sc. (1848), in Aug., 1856. In its Proc. v. 10, pt. 2, p. 51-69, illus. Albany, N. Y. 1857.
 Extracts also in Amer. J. Sc. (1818), v. 73 (ser. 2, v. 23), p. 187-203, illus. Mar. 1857; & in Mining Mag. (1853), v. 9, p. 529-42. Dec. 1857.
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- 1862 WORTHEM, A. H. Remarks on the age of the so-called "Le Clare limestone" and "Onondaga salt-group" of the Iowa Report.
 In Amer. J. Sc. (1818), v. 83 (ser. 2, v. 33), p. 46-8. Jan. 1862.

POPE'S EXPEDITION ALONG THE 32ND PARALLEL FOR
 THE BORING OF ARTESIAN WELLS (1855)

History

"Capt. John Pope organized a party under instructions from the Secretary of War, January 5, 1855, to ascertain the practicability of constructing artesian wells upon the arid plains of Texas and New Mexico. . . .

"The first operations were from the Rio Grande, east to the headwaters of the Canadian, the Red River, the Brazos, and the Colorado, with their tributaries. . . ." A. A. HUMPHREYS. p. 31-3. (In PACIFIC RR. SURV. v. 7, Serial no. 764-797. Nov. 1856.)

The expedition was carried on between May, 1855, and the latter part of 1856. Dr. George G. Shumard accompanied the party in the capacity of geologist. No official report seems to have been rendered by Pope. Shumard made collections and described the geology of the regions traversed. The collections were described by his brother, B. F. Shumard, and H. A. Prout, of the Academy of Science of St. Louis (1856). See below, PAPERS IN SOCIETY TRANSACTIONS.

See also MERRILL, (1), p. 444, for a discussion of the geological aspects of the Expedition. See below for brief Preliminary

Report. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 323.

Many of the specimens collected were described in the Zoological Reports of the Pacific Railroad Surveys (1853), q. v., v. 8-10.

See also under TEXAS GEOL. SURV. (1858): Bibliography: 1886. G. G. Shumard.

Preliminary Report

- 1857 POPE, John. Report of . . . on artesian well experiment . . . Washington, 1857. (In U. S. 35th Cong., 2d sess., Sen. Ex. Doc. v. 2, no. 1, pt. 1, p. 582-83, 590-608) Serial no. 975.
In the Report of the Secretary of War.

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- 1857 SHUMARD, G. G. Observations on the geological formations of the country between the Rio Pecos and the Rio Grande, in New Mexico . . . near the line of the 32nd parallel, being an extract of a portion of the geological report of the expedition under Capt. Pope in 1855 . . .
Rd before Acad. Sc. St. Louis (1856), Nov. 16, 1857. In its Trans. v. 1, p. 273-89. 1858.
- 1858 PROUT, H. A. Description of new species of Bryozoa from Texas and New Mexico . . . collected by Dr. G. G. Shumard, geologist to the expedition for the boring of artesian wells along the 32nd parallel . . . under Capt. Pope . . .
Rd before Acad. Sc. St. Louis (1856), Mar. 22, 1858. In its Trans. v. 1, p. 228-35. 1858.
- SHUMARD, B. F. Notice of new fossils from the Permian strata of New Mexico and Texas, collected by G. G. Shumard . . . on the United States Expedition along the 32nd parallel . . .
Rd before Acad. Sc. St. Louis (1856), Mar. 22 & May 9, 1858. In its Trans. v. 1, p. 290-97, 387-403, 1 pl. [10 fig.] 1858 & 1859.
- SHUMARD, G. G. The geological structure of the "Jornada del Muerto," New Mexico, being an abstract from the geological report of the expedition under Pope . . .
Rd before Acad. Sc. St. Louis (1856), July 26, 1858. In its Trans. v. 1, p. 341-55. 1859.

WARREN'S SIOUX EXPEDITION (1855)

History

"While making this reconnaissance I was attached to the staff of General Harney, commanding the 'Sioux Expedition'; and was assisted by P. Carrey and J. H. Snowden. . . . I left St. Louis on

the 7th of June, 1855, and proceeded up the Missouri to Fort Pierre. . . . On the 7th of August, in company with Mr. Carrey, I left Fort Pierre for Fort Kearney, which point was reached on the 21st of August. Here joining General Harney, I accompanied the army along the Platte on the route to Fort Laramie. . . . From Fort Laramie the expedition went to Fort Pierre, over the route along White River, through the Bad Lands, and along the ridge between the Little Missouri and Big Shyenne Rivers. From Fort Pierre, I returned to the mouth of the Big Sioux, through Minnesota, in company with a train under Capt. Van Vliet." G. K. WARREN, p. 87-8. (In *Pacific R.R. Surv.* v. 11, 1859.)

Warren's Report was rendered March 15, 1856. He made some natural history collections, which were described by F. V. Hayden and others. For review of geological contents, see MERRILL, (1), p. 586-87. Warren continued explorations in this region and adjacent country during 1856-58, for which see WARREN'S EXPLORATIONS IN NEBRASKA & DACOTAH (1856). See also MERRILL. *First 100 yrs. Amer. Geol.* 1924. p. 503-4.

See, below, PAPERS IN SOCIETY TRANSACTIONS, for a number of papers on the collections made by Warren and his party, published prior or subsequent to his official report.

Report

1856 WARREN, G[ouverneur] K[emble]. Report of his exploration of the country between the Missouri and Platte Rivers and the Rocky Mountains: . . . the Sioux Expedition of explorations in the Dacotah Country . . . 1855. Washington, 1856. 79+6 p. illus. (In U. S. 34th Cong., 1st sess., Sen. Ex. Doc. v. 13, no. 76). Serial no. 822.

Rendered Mar. 15, 1856. Rev. in *North Amer. Rev.* v. 87, p. 66-94. July, 1858.

CONTENTS:

- p. 5-62 WARREN, G. K. Report of . . . the Sioux Expedition of explorations in the Dacotah country, 1855.
 - p. 63- 6 BLAKE, W. P. Geological note on section, in ravine of L'Eau Qui Court River (Rapid River). appx. E. sect.
 - p. 66-79 HAYDEN, F. V. . . . Brief sketch of the geological and physical features of the Upper Missouri River, with some notes on its soil, vegetation, animal life . . . appx. E. Written Mar. 15, 1856.
- appx. 6 p. Index.

Papers in Society Transactions

- 1856 MEEK, F. B., and HAYDEN, F. V. Descriptions of new fossil species of Mollusca collected by Dr. F. V. Hayden in Nebraska Territory, together with a complete catalogue of all the remains of Invertebrata hitherto described and identified from the Cretaceous and Tertiary formations of that region.
Rd before Phila. Acad. Nat. Sc. (1812), Nov. 11, 1856. In its Proc. v. 8, p. 265-86.
- LEEDY, Joseph. Notices of extinct Vertebrata discovered by F. V. Hayden, during the expedition to the Sioux Country, under . . . Warren.
Rd before Phila. Acad. Nat. Sc. (1812), Dec. 23, 1856. In its Proc. v. 8, p. 311-12.
- 1857 MEEK, F. B., and HAYDEN, F. V. Descriptions of new species and genera of fossils collected by F. V. Hayden in Nebraska Territory under the direction of Lieut. G. K. Warren . . . with some remarks on the Tertiary and Cretaceous formations of the northwest and the parallelism of the latter with those of other portions of the United States and Territories. (Explorations of the War Department.)
Rd before Phila. Acad. Nat. Sc. (1812), April 28, 1857. In its Proc. v. 9, p. 117-48.
- HAYDEN, F. V. Note explanatory of a map and section illustrating the geological structure of the country bordering on the Missouri River, from the mouth of the Platte River to Fort Benton, in lat. 47° 30' N. Long., 110° 30' W. . . . (Explorations under the War Dept.)
Rd before Phila. Acad. Nat. Sc. (1812), May 12, 1857. In its Proc. v. 9, p. 109-16, map.
- 1860 MEEK, F. B., and HAYDEN, F. V. Descriptions of new organic remains from the Tertiary, Cretaceous and Jurassic rocks of Nebraska.
Rd before Phila. Acad. Nat. Sc. (1812), May 15, 1860. In its Proc. v. 12, p. 175-85.
- . Systematic catalogue with synonymy, etc., of the Jurassic, Cretaceous and Tertiary fossils collected in Nebraska by Warren's Exploring Expedition.
Rd before Phila. Acad. Nat. Sc. (1812), Oct. 2, 1860. In its Proc. v. 12, p. 417-32.
- 1861 HAYDEN, F. V. On the geology and natural history of the Upper Missouri.
Rd before Amer. Phil. Soc. (1769), July 19, 1861. In its Trans. n. s. v. 12, art. 1, p. 1-218, illus. col. map. 1863.
Contains "Reports of Progress" for this Exped., that of Warren's "Explorations in Nebraska & Dacotah (1856), q. v., and Raynold's Explor. Yellowstone (1859), q. v.

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Historical introduction, p. 1-3.

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- 2, Rocks of Nebraska and Kansas.
ch. 7-14, p. 33-137.
- 3, Zoology and botany.
ch. 15-18, p. 138-212.

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BINNEY, W. G. Examination of the shells. p. 179-82.
 ENGELMANN, George. Botany. ch. 18, p. 182-209.
 DEWEY, Chester. List of Nebraska Carices. p. 210-12.
 Other specimens, zoological and palaeontological, described
 by BAIRD, COPE, GILL, LEA, NEWBERRY, & MEEK.

- 1862 ————. Contributions to the ethnography and philology of the Indian tribes of the Missouri Valley.
 Rd before Amer. Phil. Soc. (1769), May 16, 1862. In its Trans. n. s. v. 12, art. 3, p. 231-461, 2 pl. map. 1863.
 See also Warren's Exped. to Nebraska & Dacotah (1856) & Raynolds' Exped. to the Yellowstone (1859).
 Abstr. of paper is in Amer. J. Sc. (1818), ser. 2, v. 34, p. 57-66. July, 1862.
- 1864 ————. Palaeontology of the Upper Missouri: a report upon collections made principally by the expeditions under the command of Lieut. G. K. Warren, in 1855 and 1856; part 1: Invertebrates.
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 For dates of issue of parts, and contents, see under SMITH. INST. (1846), May, 1864.

WISCONSIN NATURAL HISTORY ASSOCIATION, MILWAUKEE (1855)

History

In 1855 there was founded and incorporated at Milwaukee the "Wisconsin Natural History Association." The date of incorporation is given as Feb. 21, 1855.

"Leonard J. Farwell, William Dudley, Samuel Sercomb, Increase A. Lapham, Philo R. Hoy, Constantine A. Barry, James G. Percival, Edward Daniels, and such other persons as may from time to time become members, shall be and are hereby constituted a body politic and corporate, by the name of the Wisconsin Natural History Association, at Milwaukee. . . ."

"The object of the Association shall be to promote the progress of the natural sciences especially by investigating the geology, bot-

any and zoology of Wisconsin, the establishment of a museum and library, the reading of original papers, and by other suitable means. . . ." From the CONSTITUTION.

In 1860, the president was Increase A. Lapham, the vice-president, N. A. Staples, the recording secretary, George S. Allan, the corresponding secretary, E. P. Larkin, the treasurer, Charles Caverno, the directors, J. E. Garner and Andrew Kerr. The Society appears to have had a short-lived existence, as little more has been written concerning it. This group represented the English-speaking supporters of the natural sciences.

At the instigation of Peter Engelmann (1823-1874), supervisor of the German and English Academy in Milwaukee, there was organized on May 6, 1857, "Der Naturhistorische Verein von Wisconsin." The members of this group were nearly all German-speaking devotees of the natural sciences. The officers of the Verein at the time of the publication of its first annual report in 1866 were as follows: F. A. Leuning, president; Ed. Vintsehger, vice-president; Peter Engelmann, corresponding secretary; W. Lorenz, recording secretary; G. Preusser, librarian; Fr. A. Pfaff, director of zoology, etc.

This organization was fairly active for many years and in 1879 was incorporated as the Natural History Society of Wisconsin. This Society was instrumental in the formation of the present Milwaukee Public Museum.

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ACADEMY OF SCIENCE OF ST. LOUIS (1856)

History

“ . . . The time finally ripened and after several preliminary meetings, of which no record was preserved, the organizers of the Academy of Science of St. Louis met in the Hall of the Board of Public Schools, March 10, 1856. The fifteen persons responding to roll call on that occasion were physicians, George Engelmann, Moses L. Linton, Wm. M. McPheeters, Moses M. Pallen, Simon Polak, Charles A. Pope, Hiram A. Prout, Benjamin F. Shumard, Charles W. Stevens, Wm. A. Tingley, John H. Walters, Adolphus Wislizenus; civil engineer, James B. Eads, lawyer, Nathaniel Holmes, and fur trader and traveller, Charles P. Chouteau. . . . The following officers were elected to serve the first year: George Engelmann, president; H. A. Prout and Nathaniel Holmes, first and second vice-presidents; B. F. Shumard and Wm. A. Tingley, secretaries; J. B. Eads, treasurer; M. M. Pallen, Adolphus Wislizenus, B. F. Shumard and C. W. Stevens, curators. . . .”

“On the 17th of January following, a charter incorporating the Academy was signed and approved, and this was accepted by a vote of the Academy on the 9th of February, 1857. The Act of Incorporation declares the object of the Academy to be ‘the promotion of science.’ Its scientific activities at that early date were distributed among the following fourteen standing committees: anatomy, comparative; botany, chemistry, embryology, entomology, ethnology, geology, mammology, mineralogy, ornithology, monstrosities, palaeontology, and physics. . . .”

“The members began their discussions with objects of magnitude, for the *Zeuglodon*, a gigantic fossil whale, and the *Missourium* (*Mastodon giganteus*) were the subjects of the first debates along the line of science. The Academy authorized the spending of its first money to pay the expenses of a trip south by Albert C. Koch, who made the journey to study the then much talked about *Zeuglodon* fossil remains of Mississippi. . . .

“ . . . The name of the St. Louis Academy was placed on the exchange list of the Philadelphia Academy before the Society had any publications to exchange. . . .

“The organization meeting closed with fifteen charter members; in 1860, just before the Civil War, the total had grown to 150. . . .”
Extracts from WHELPLEY, H. M. p. 22. 1906 (see Bibliography, below, 1906).

"At the second meeting of the Academy, April 21, 1856, Col. John O'Fallon, through Dr. C. A. Pope, offered to the Academy the free use of the Cabinet Hall and other rooms suitable for the purposes of the Academy in the Dispensary building of the St. Louis Medical College (also known as Pope's College). . . . In this building were established the first museum and library of the Academy. . . ." HAMBACH, G. 1906. (See Bibliography: 1906, below.)

Large collections were presented during the period 1856-65 by F. V. Hayden, who was then working in the Bad Lands of Nebraska; Charles P. Chouteau, T. C. Hilgard, Charles Pope, C. W. Stevens, and Adolph Wislizenus. The books, 120 volumes of the extinct WESTERN ACADEMY OF NATURAL SCIENCES OF ST. LOUIS (1836), q. v., were turned over to the Academy Aug. 4, 1856.

The Academy issued two volumes of Transactions during the decade 1856-1866, the first number of volume 1, having been published in 1857. See below TRANSACTIONS: Dates of Publication, for the first two volumes.

For the various aspects of the Academy's history, see below, the BIBLIOGRAPHY.

In addition to the names noted above, and to those contained below in the PAPERS ON NATURAL HISTORY, active members of the Academy, who served as curators or in other offices, but very rarely as contributors to its Transactions, were: John Lebrecht, J. S. B. Alleyne, Edward Wyman, John Moss, E. H. Gregory, G. H. E. Baumgarten, Samuel Reber, M. L. Clark, Bretton A. Hill, G. C. Broadhead, Enno Sander (treasurer for many years); Nathaniel Holmes (secretary 1857-65).

Presidents

1856	George Engelmann
1857-58	B. F. Shumard
1859	Adolphus Wislizenus
1860	H. A. Prout
1861-65	George Engelmann

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BRYAN'S EXPEDITION FROM FORT RILEY TO BRIDGER'S PASS (1856)

History

Lt. F. T. Bryan under orders from the Secretary of War conducted a military expedition from Fort Riley, Kansas, to Bridger's Pass, Utah, between June 21 and October 18, 1856.

He was accompanied by Henry Engelmann in the capacity of geologist and by John Lambert, topographer. His Final Report was rendered Feb. 19, 1857, and published the same year, as an appendix to the Annual Report of the Secretary of War for 1857. The collections made by the expedition were sent to the Smithsonian Institution, and partially described in v. 8, 9 & 10 of the Final Reports of the PACIFIC RAILROAD SURVEYS (1853), q. v.

B. F. Shumard described the palaeontology of the expedition.

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CHICAGO ACADEMY OF SCIENCES (1856)

History

"The Chicago Academy of Sciences is believed to have the honor of being organized at an earlier date than any other scholarly body now existing in Chicago. In the year 1856 a small circle of enthusiastic gentlemen united in a Society for the promotion of scientific investigation, and adopted the name, 'The Chicago Academy of Natural Sciences' " These, the original members of the Academy were, James V. Z. Blaney, Nathan S. Davis, Sr., James W. Freer, C. A. Helmuth, Hosmer A. Johnson, Edmund Andrews, Henry Parker, J. Young Scammon, Franklin Scammon, Richard K. Swift, Joseph D. Webster, Eliphalet W. Blatchford and Henry W. Zimmermann. To this list many new names were added, and the new Society grew and developed rapidly.

A definite organization was completed at a meeting held January 13, 1857, in the office of Dr. Edmund Andrews, and the following officers were elected: James V. Z. Blaney, president; N. S. Davis,

Sr, and J. D. Webster, vice-presidents; H. A. Johnson, secretary; Henry Parker, recording secretary; R. K. Swift, treasurer; and Edmund Andrews, curator and librarian.

The need of funds soon became apparent and subscriptions to the extent of \$1,500 were readily obtained. A room was rented in a building located at the southeast corner of Clark and Lake Streets, a few cases were procured, and the foundation of a museum was laid. This favorable beginning, however, was of short duration, for the financial crisis of 1857 and 1858 left but few of the subscriptions in a condition for collection. The Society was unable to pay the salary of the curator or to increase its museum accommodations. The publication of transactions had been planned, but this, the most ambitious wish of the members, was necessarily postponed. However, a few of the members worked on the cabinet in their leisure and interesting monthly meetings were sustained.

In 1859, under the provisions of a general law, the Society was incorporated under the name, "The Chicago Academy of Sciences" . . .

Renewed activity and interest was the result of this reorganization. Much of the stimulus of this activity, as in the earlier period of the Society, was furnished by Mr. Robert Kennicott, a young naturalist of great promise. He, with Dr. Edmund Andrews, had placed in the museum the larger number of the many thousand specimens already on exhibition. About this time Mr. Kennicott joined a scientific expedition to northwestern Arctic America. In the year 1862 after an absence of three years, he returned, bringing an abundant supply of material in all the departments of natural history and ethnology.

The expenses of this expedition, defrayed by the Smithsonian Institution, and by several residents of Chicago, were materially lessened by the unprecedented liberality of the officers of the Hudson Bay Co., acting both as officials and as individuals. The expedition was undertaken with the understanding that the Smithsonian Institution should be the first beneficiary, but that any other institution that Mr. Kennicott should designate, and which would suitably provide for their reception and care, should also have a full series of the specimens. Mr. Kennicott naturally desired that this series should have a home in Chicago, and designated the Academy as the second beneficiary.

In the winter of the years 1863 and 1864 the affairs of the museum began to assume a more definite form. The value of the collections already offered, and the readiness of the Smithsonian Institution to fulfill its agreement as to duplicates and to add much other material from its abundant stores, induced several prominent citizens of Chicago to undertake the founding of a permanent and more extensive museum of natural and applied sciences in the youthful metropolis of the central west.

Professor Louis Agassiz of Harvard University, accepted an invitation to address a meeting of those interested. This meeting was held February 22, 1864, at the residence of Mr. Edmund Aiken. Both the lecturer and the occasion aroused great enthusiasm. A subscription paper was started, to which the names of about 125 persons were soon appended, each agreeing to give the sum of \$500. The leading spirits in this movement were J. Y. Scammon, G. C. Walker, E. B. McCagg, E. W. Blatchford, Daniel Thompson [and Robert Kennicott] . . .

In March of the year 1865 the Western Union Telegraph Co. planned an expedition to survey along the northwest coast of North America for the purpose of establishing a route for a telegraph line intended to connect this continent with Asia by crossing the Behring Straits. The company very generously offered to naturalists the opportunity to conduct scientific investigations in a country at that time scarcely known, and nearly inaccessible. Mr. Kennicott, who had been elected the Curator of the Academy early in the previous year, with other young naturalists as his associates, eagerly availed themselves of the unusual facilities thus granted. The outfit for scientific investigation and collecting, costing about one thousand dollars, was furnished by the Academy.

“On March 21, 1865, Mr. Kennicott sailed from New York on the steamer ‘Golden Rule’ . . . The party arrived at San Francisco on April 25. While there, Mr. Kennicott was notified of his election to the office of the ‘Director of the Academy’ . . .” Extracts from HIGLEY, W. K. p. 5-13. (See Bibliography: 1902, below.)

The first volume of the Academy’s “Transactions” was published between 1867 and 1869. A disastrous fire which destroyed the bulk of the collections, books, etc., in 1866, caused delay in the publication of the Transactions, and of many papers which William Stimpson, the Secretary of the Academy, had ready for the press.

The Presidents of the Academy were: 1856-61, J. V. Z. Blaney; 1862-64, J. Y. Scammon; 1865, Edmund Andrews.

The Secretaries of the Academy were: 1857-64, Robert Kennicott; 1865-75, William Stimpson.

The Curators were: 1856-63, Edmund Andrews; 1862-63, J. M. Woodworth; 1864, Robert Kennicott; 1865-72, William Stimpson.

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 Repub. from his "Descriptions of new species of fossils from the Palaeozoic rocks of the western states." 1860-61.
 According to B. F. Shumard, p. 1-56, Jan. 3, 1860; p. 57-76, May 24, 1860; p. 77-96, Feb. 1861.
 Rev. in Amer. J. Sc. v. 82 (ser. 2, v. 32), p. 122-23. July, 1861.
- 1865 LAPHAM, I. A. On the climate bordering upon the Great North American lakes. T. v. 1, art. 2, p. 58-60, map.
 MEEK, F. B. Remarks on the geology of the valley of the Mackenzie River, with figures and descriptions of fossils from that region, in the museum of the Smithsonian Institution, chiefly collected by the late Robert Kennicott, Esq. T. v. 1, art. 3, p. 61-114, 5 pl. [41 fig.]

STIMPSON, William. Illustrations of North American birds in the Museum of the Chicago Academy of Sciences. T. v. 1, art. 5, p. 128-29, 4 pl.

_____. Robert Kennicott. T. v. 1, p. 133-226.

Contains copious and extended extracts from Kennicott's Journals of Travels in the Hudson Bay Country.

THE CINCINNATUS (1856)

History

The CINCINNATUS, an agricultural journal edited by the faculty of Farmers' College, made its first appearance in January, 1856. Although primarily agricultural in scope, the six volumes of this periodical usually contained a popular article on natural history in each number. See below the PAPERS ON NATURAL HISTORY to be found in these volumes. It also served as the publication organ for the Cincinnati Horticultural Society.

The College was located at College Hill, Ohio, and the faculty of the institution maintained a botanic garden, for the account of which see below, PAPERS ON NATURAL HISTORY: v. 1, p. 598-600. Dec. 1856.

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VAUGHAN, D. D. The absence of trees from prairies. p. 268-74.
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GLOVER, Townend. Agricultural entomology. p. 392-96.
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v. 1, no. 9, September

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v. 1, no. 12, December

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ANON. Honey-bee. p. 289-95.

KIRTLAND, J. P. *Aegeria exitosa*, or peach tree worm. p. 305-8, illus.
From the Western Farmer & Gardener.

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CARY, F. G. Sexuality of plants—fecundation and hybridization . . . p. 337-44.

v. 2, no. 9, September

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v. 2, no. 10, October

ELLINGWOOD, J. P. An ethnological inquiry concerning the aboriginal races of America. p. 433-35.

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*HIND, H. Y. Description and classification of insects. p. 316-22.

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v. 3, no. 11, November

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STAUFFER, Jacob. Entomology—the natural history of insects. p. 504-7, illus.

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v. 4, no. 6, June

CLINGMAN, T. L. The resources of North Carolina. p. 270-75.

v. 4, no. 9, September

COOPER, J. G. On the cultivation of trees by the North American Indians in former times. p. 385-89.

WARREN'S EXPLORATIONS IN NEBRASKA & DACOTAH
(1856)

History

"The principal objects of the expedition were to ascertain the best route by which to continue to the South Pass the military road

now constructing from the Mississippi River to Sioux City, on the Missouri, and to examine in this connection the Valley of the Loup Fork of the Platte, and that of the Niobrara, and to make such reconnaissance of the Black Hills, about the sources of the Big Cheyenne, as circumstances would permit, to determine their character, especially with reference to the future military operations that may be carried on in this territory. In accomplishing these objects, the Expedition would obtain information of the character and resources of the country, its adaptability to settlement and cultivation, and would develop its geography and geology along the routes pursued . . .”

“The routes reconnoitred and mapped in 1857 are from Sioux City to the mouth of Loup Fork, thence up this stream to its source in the Sand Hills, and thence by the Niobrara to Fort Laramie. From this point the party proceeded north, and carefully examined the Black Hills, and returning to the Niobrara, explored this stream to its junction with the Missouri, and also a route from the mouth of Turtle Hill River to Fort Randall. Finally the road from Fort Randall to Sioux City was surveyed.”

“With the report on these routes, Lt. Warren combines that of the routes examined by him in 1856, under orders from General Harney, of which examinations no report has heretofore been presented.”

“In that year he made a careful reconnaissance of the Missouri River from the southern boundary of Nebraska to a point sixty miles above the mouth of the Yellowstone, and of this latter stream to Powder River.”

“The routes explored including those of 1858 (of which a report has been rendered and printed), all lie east of the 106th meridian. They lead once through the Sand Hills north and south and twice east and west, almost around the Black Hills, and through the valleys of the following rivers, viz., the Platte, Loup Fork, Niobrara, White Earth, Big Cheyenne, Missouri, Yellowstone, and Jones Rivers . . .” A. A. HUMPHREYS. *Ann. Rept. of Topogr. Eng. to Secr. War*, Nov. 20, 1858, p. 5-6 (of WARREN'S Report. Reprint. 1875—see Reports, below).

“ . . . I started from St. Louis for Fort Pierre, in the middle of April (16), 1856, accompanied by my assistants, Messrs. A. H. Hutton, J. H. Snowden, and F. V. Hayden on board Capt. Throckmorton's steamboat, Genoa . . . At Fort Pierre, I received orders

from Gen. Harney to proceed on board the American Fur Company's boat, St. Mary, and examine the Missouri River, as far as she should go, and then to return down stream by Mackinac boats . . . While waiting for the Fur Company at Fort Union, to build a Mackinac boat . . . the whole party explored the left bank of the Yellowstone to the mouth of Powder River . . . We arrived at Fort Pierre October 2, where the expedition terminated . . .” WARREN, p. 90. (*Pacific R.R. Surv.* v. 11, 1859).

Warren states that Dr. F. V. Hayden “was indefatigable in his efforts to develop the geology of the region traversed . . . A very extensive collection was also made in zoology . . .” The cost of the Expedition was about \$10,000. Warren submitted a Report Nov. 24, 1858, of which both a Senate and a House edition were published.

In 1875, a Reprint of Warren's was published under the direction of the U. S. Army Engineers. See below REPORTS. See also MERRILL, (1), p. 586-87, for critical review of the geological contents of Warren's Reports. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 503-4, 711-14.

A large number of papers describing the collections made, the bulk of which were deposited with the Smithsonian Institution (1846), q. v., were presented to various societies, and published in their proceedings or transactions. See below PAPERS IN SOCIETY TRANSACTIONS.

These were made chiefly by Hayden, F. B. Meek, Joseph Leidy, J. S. Newberry, W. G. Binney, S. F. Baird, Chester Dewey, Robert Kennicott, Charles Girard, between 1857 and 1862. Several of Hayden's papers are extended monographs, comprehending the geology, palaeontology, ethnology and zoology of the various regions explored.

See also Warren's previous exploration, WARREN'S SIOUX EXPEDITION (1855).

The expedition for the examination of the Black Hills was carried out under orders from John B. Floyd, Sec. of War, dated May 7, 1857. Warren was accompanied by F. V. Hayden, geologist and palaeontologist, W. P. C. Carrington, meteorologist, S. Moffitt, surgeon, P. M. Engel, topographer, J. H. Snowden, and Lt. James Macmillan.

Specimens collected by Warren's parties were described in the Zoological Reports of the Pacific Railroad Surveys (1853), q. v., v. 8-10.

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(2), Senate ed., Serial no. 975 & 976.

- . Same . . . Washington, 1858. (In U. S. 35th Cong., 2d sess., Sen. Ex. Doc. v. 2 & 3, no 1, pt 1-2, p. 620-747) Serials no. 975-976.
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p. 671-747 are in Serial no. 976.
Report rendered Nov. 24, 1858.
See also p. 585-88, of Serial no. 975.

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- p. 620-70 WARREN, G. K. Report.
Repr. 1875, p. 9-54.
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ch. 2, Physical geography of Nebraska . . .
ch. 3, Remarks on climate . . .
ch. 4, Description of the principal rivers, and discussion of the merits of the different routes.
ch. 5, Indians, military posts . . .

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- p. 671-73 MOFFITT, S. H. Medical report.
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p. 673-747 HAYDEN, F. V. Report: Catalogue of the collections in geology and natural history obtained by the expedition under the command of Lt. G. K. Warren. Written Nov. 28, 1858.
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- p. 676-705 Geology and palaeontology.
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- p. 706- 10 Mammals, by S. F. BAIRD.
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- p. 711- 22 Birds.
In 1875 Repr., p. 95-103.
- p. 722- Fishes, by Charles GIRARD.
In 1875 Repr., p. 104.
- p. 722- 23 Reptiles, by BAIRD & KENNICOTT.
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ARKANSAS GEOLOGICAL SURVEY (1857)

History

"The subject of a state geological survey of Arkansas was first brought to public attention by Gov. Elias N. Conway in his message to the legislature in 1856. Upon his recommendation the matter was taken into consideration, and the first geological survey of the state was begun under an act passed January 4, (approved Jan. 15), 1857. This act provided for the appointment of a state geologist by the governor, and an appropriation of \$4,800 per annum, out of which all expenses were to be paid. Dr. David Dale Owen, then state geologist of Kentucky, was appointed state geologist of Arkansas, and entered upon his duties October 1, 1857. The results of the work done are given in his 'First Report . . . 1858' . . . "

"The bill providing for the continuation of the survey passed in February, 1859; by its provisions the state geologist's salary was raised from \$1,800 to \$2,500, and an appropriation of \$6,600 per annum was made for the survey work. Under this act Owen was again appointed state geologist. Before the next legislature convened Dr. Owen died (Nov. 13, 1860), and his second report . . . was edited by his brother Richard Owen and Prof. J. P. Lesley."

"The Civil War broke out shortly after the publication of Dr. Owen's Second Report and all such work was necessarily suspended in the southern states. No steps were taken to finish the geological survey of Arkansas until after the close of the war." HAYES,

1911, (U. S. Geol. Surv. Bull. no. 465), p. 17. (Repr. from BRANNER, J. C. Geol. Surv. Arkansas. Jour. of Geol. v. 2, p. 826-28. 1894).

During the life of the survey, Owen's assistants were Edward T. Cox, assistant geologist; William Elderhorst, chemical assistant; Robert Peter, chemist; Leo Lesquereux, botanist and palaeontologist; Joseph Lesley, assistant.

For a discussion of the geological contents of the Reports, see also MERRILL, (1), p. 482-83. See below, under Bibliography, Branner, 1894, and Merrill, 1920, for extended histories of the Survey. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 365-67.

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 p. 143- 91 ELDERHORST, William. Chemical report of the ores, rocks, and mineral waters of Arkansas. Written Sept. 1858.
 p. 193-244 COX, E. T. Report of a geological reconnaissance of a part of the state of Arkansas made during the years 1857 and 1858. Written October 15, 1858.

1860 OWEN, David Dale, and others. Second report of a geological reconnaissance of the middle and southern counties of Arkansas made during the years 1859 and 1860 . . . by David Dale Owen, principal geologist, and Robert Peter, chemical assistant, M. Leo Lesquereux, botanist, Edward Cox, assistant geologist . . . Phila. C. Sherman & son, 1860. 433 p. illus. 14 pl. chart.

Report edited by Richard OWEN, & J. P. LESLEY.

CONTENTS:

- p. 1-153 OWEN, D. D. Report.
 p. 155- 62 LESLEY, Joseph. Survey of the Fourche Cove in Pulaski County, Arkansas. Made Dec. 1, 1860.
 p. 163-287 PETER, Robert. Chemical analysis of the soils, sub-soils, underclays, clays, and nitre earths of Arkansas collected by D. D. Owen and analysed by Robert Peter. Written July 30, 1860.
 p. 289- 94 ELDERHORST, William. Chemical analyses made for the Geological Survey of Arkansas.
 p. 295-345 LESQUEREUX, Leo. Botanical and palaeontological report. 9 pl. [56 fig.]
 Rev. in Amer. J. Sc. v. 81, (ser. 2, v. 31), p. 431-35. May, 1861.
 p. 346- 99 ————. Catalogue of the plants of Arkansas.
 p. 401- 20 COX, E. T. Second report of a geological reconnaissance of a part of the state of Arkansas during the years 1859 and 1860.
 p. 421- 33 Index.

IVES' EXPEDITION UP THE COLORADO RIVER (1857)

History

During the summer of 1857, Lt. J. C. Ives was ordered by the Secretary of War to explore the Colorado River, "the main object of which was to ascertain the navigability of the Colorado, with especial reference to the availability for the transportation of supplies to the various military posts in New Mexico and Utah."

Ives' party assembled in San Francisco in October, 1857, and reached the mouth of the Colorado November 28, 1857. The expedition terminated May 23, 1858. Ives' preliminary report was rendered in 1858 (see Bibliography, below), and his final report with accompanying scientific papers was made May 1, 1860, and published in 1861.

J. S. Newberry was the geologist and naturalist of the expedition; Messrs. H. B. Mollhausen and F. W. Egloffstein, artist and naturalist, and topographer respectively. Newberry was also the expedition's physician.

Large collections were made and described by Messrs. Newberry, Baird, Gray, Engelmann, Torrey, Thurber, ————. For a review of the geological contents of the Report, see also MERRILL, (1), p. 477-78, with a map of the route followed, on p. 479. See also PACIFIC RR. SURV. (1853), v. 8-10, for the descriptions of animals collected on the expedition; the zoology of this expedition being similar to that described in the above series of explorations. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 360-62.

Bibliography

- 1859 IVES, Joseph C[hristmas]. Preliminary report of the Colorado Exploring Expedition: 1857-58. Washington, 1859. (In U. S. 35th Cong., 2d sess., Sen. Ex. Doc. v. 2, no. 1, p. 608-19) Serial no. 975.

In Ann. Rept. of War Dept. for 1858.

Repr. (In U. S. 35th Cong., 2d sess., H. Ex. Doc. v. 2, no. 2, p. 608-19) Serial no. 998.

Report

- 1861 IVES, Joseph C[hristmas]. . . . Report upon the Colorado River of the West explored in 1857 and 1858 . . . under the direction of the office of explorations and surveys . . . Washington, 1861. [371 p.] (131 + 14 + 158 + 30 + 6 + 32 p.) illus. pl. port. maps, sect.

charts, tab. diagr. 4°. (In U. S. 36th Cong., 1st sess., H. Ex. Doc. v. 14, no. 90) Serial no 1058.

Rendered May 1, 1860. Rev. in Amer. J. Sc. v. 83 (ser. 2, v. 33), p. 387-403. May, 1862.

SUMMARY OF CONTENTS:

- pt. 1 IVES, J. C. General report. 131 p.
 2 Hydrographic report. 14 p.
 3 NEWBERRY, J. S. Geological report. 158 p.
 4 GRAY, Asa, and others. Botany. 30 p.
 5 BAIRD, S. F. Zoology: Birds. 6 p.
 Appx. Astronomical & meteorological observations. 32 p.

CONTENTS:

- Pt. 1, IVES, J. C. General report. 131 p. 41 illus. 26 pl. port. 2 maps, front.
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 p. 25- 37, ch. 1, Mouth of the Colorado
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 p. 123- 31, 10, Moquis to Fort Defiance—Conclusion
 Pt. 2, Hydrographic report. 14 p.
 Pt. 3, NEWBERRY, J. S. Geological report. 158 p. 27 illus. 6 pl. [32 figs.] 2 maps.
 p. 9- 12, ch. 1, Geology of coast of southern California
 p. 13- 8, 2, Geology of route from San Diego to Fort Yuma
 p. 19- 28, 3, . . . Of country bordering Lower Colorado
 p. 29- 40, 4, Geology of region between Bill Williams' Fork and Rio Virgen
 p. 41- 8, 5, General view of the structure of the Great Central Plateau
 p. 49- 64, 6, Geology of the country between the Mojave Valley and Flax River
 p. 65- 73, 7, Geology of region about San Francisco Mountain
 p. 74- 91, 8, Geology of region between the Colorado and Fort Defiance
 p. 92-101, 9, Geology of the route from Fort Defiance to Santa Fe

- p. 102- 15, 10, Geology of route from Santa Fe to Fort Leavenworth
p. 116- 32, 11, Palaeontology
p. 133- 54, Catalogue of the geological collection
Pt. 4, GRAY, Asa, and others. Botany. 30 p.
p. 1-30, GRAY, Asa. Botany.
p. 12- 4, Cactaceae, by George ENGELMANN
Also in Repr. of E's Papers. 1887. p. 220-22. p. 20, by TORREY
p. 23, Convolvulaceae, by ENGELMANN
p. 26- 7, Euphorbiaceae, by ENGELMANN
Also in Repr. of E's Papers. 1887. p. 440-41.
p. 29-30, Graminae, by George THURBER
Pt. 5, BAIRD, S. F. Zoology: List of birds. 6 p.
For zoology of this region, see General Report on Zoology of PACIFIC RR. SURV. (1853), v. 8-10, which covered the same territory.
Appx. Astronomical and meteorological observations. 32 p.

MICHLER'S SURVEY OF THE ISTHMUS OF DARIEN (1857)

History

Under authorization of an act approved March 3, 1857, Lt. Nathaniel Michler was ordered in July, 1857, to make a survey for an interoceanic ship canal near the Isthmus of Darien. The Survey was begun December 28, 1857, and was completed March 3, 1858.

Arthur Schott was selected as Michler's principal assistant, acting as naturalist and geologist on the survey. Charles and William Wood were his assistants in making the zoological collections. Michler had ten other assistants for his meteorological and surveying work.

Michler's Report was published in 1861. The natural history collections were described by Messrs. Schott, W. H. Harvey, Cope, D. C. Eaton, John Cassin, and Theodore Gill.

For several preliminary papers, see PAPERS IN SOCIETY TRANSACTIONS.

The final report appeared in two volumes, volume 1 containing the text and volume 2, the maps. For contents, see below.

Report

- 1861 MICHLER, Nathaniel. Report of a survey for an interoceanic ship canal near the Isthmus of Darien. Washington, 1861. 2 v. maps. tab. (In U. S. 36th Cong., 2d sess., Sen. Ex. Doc. v. 7, no 9, 2 parts) Serials no. 1085 & 1086.
v. 1, 457 p., Text; v. 2, Maps.

CONTENTS:

v. 1, Serial no. 1085, 457 p.

- p. 2- 23 MICHLER, N. Official reports.
p. 23- 99 ———. Chapter descriptive of the natural features of the country along the line of survey of the proposed interoceanic ship canal, etc., from the Gulf of Darien to the Pacific Ocean, via the Atrato and Truando Rivers.
p. 100- 47 ———. General outfit—climate—engineering observations . . .
p. 148- 68 SCHOTT, Arthur. Report on the physiography and geology of the Isthmus of Choco. Written June 1, 1859.

Appendixes

- p. 169- 73 ———. Remarks on the geologic structure on the country, with accompanying descriptive table of geological specimens. Appx. A. tab.
p. 175- 79 *HARVEY, W. H., and SCHOTT, Arthur. Botany: Algae. Appx. B.
p. 179- 89 EATON, D. C., and SCHOTT, Arthur. Botany: Filices and Lycopodiaceae. Appx. C.
p. 190-211 SCHOTT, Arthur. Botany: Phanerogamae. Appx. D.
p. 212- 18 ———. Zoology: Mammalia. Appx. E.
p. 219- 54 CASSIN, John, and SCHOTT, Arthur. Zoology: Birds: Appx. F.
p. 255- 56 SCHOTT, Arthur. Zoology: Reptiles and Amphibia. Appx. G.
p. 257- 59 GILL, Theodore. Zoology: Fishes. Appx. H. Written Jan. 14, 1861.
p. 260- 68 SCHOTT, Arthur. Zoology: Invertebrates. Appx. I.
p. 269-457 ———. Physiographic tables on the Isthmus of Choco comprising the results of Geodetic Survey. Appx. K.

v. 2, Serial no. 1086

Contains the Maps. 17 pl. (maps).

Papers in Society Transactions

- 1858 CASSIN, John. Description of a new tanager (*Calliste lavinia*) from the Isthmus of Darien, and a note on *Selenidera spectabilis*, Cassin.

- Rd before Phila. Acad. Nat. Sc. (1812), Sept. 21, 1858. In its Proc. v. 10, p. 177-78.
- 1860 ————— Catalogue of birds collected during a survey of a route for a ship canal across the Isthmus of Darien . . . by Lieut. Michler . . . with notes and descriptions of new species.
 Rd before Phila. Acad. Nat. Sc. (1812), April 17, & May 22, 1860. In its Proc. v. 12, p. 132-44, 188-97.
- 1862 COPE, E. D. Catalogue of the Reptiles obtained during the explorations of the Parana and . . . by Capt. T. J. Page; and of those procured by Lt. Michler, commander of the expedition conducting the survey of the Atrato River.
 Rd before Phila. Acad. Nat. Sc. (1812), Sept. 9, 1862. In its Proc. v. 14, p. 346-59.
 Michler's Exped., p. 355-59.

NORTHWEST BOUNDARY SURVEY (1857)

History

"On August 11, 1856, almost exactly ten years after the proclaiming of the treaty of limits, which for brevity may be called the Buchanan-Pakenham Treaty, Congress passed an Act to carry its first article into effect. This act provided for the appointment of a commissioner and chief astronomer and surveyor on the part of the United States to unite with similar officers to be appointed by Great Britain, to survey the boundary and mark it with monuments.

"It also provided for the appointment of an assistant astronomer and surveyor, a secretary and a clerk; it appropriated \$11,000 for the annual salary of these five officers, \$60,000 for provisions, transportation and contingencies; it restricted the work to the northern boundary of Washington, which then extended from the Rocky Mountains to the Pacific; and finally, it authorized the President to direct the employment of such officers, assistants and vessels of the Coast Survey as he might deem necessary and useful. . . .

"Under this law, Mr Archibald Campbell was appointed commissioner on Feb. 14, 1857, and on the same day, Lieut. J. G. Parke, Corps of Engineers, U. S. A., was appointed chief astronomer and surveyor, each at a salary of \$3,000 per annum. Mr Campbell remained commissioner to the end in 1869. On the outbreak of the Civil War, Lt. Parke left the work and never returned to it. . . . Mr Joseph S. Harris served as assistant surgeon and

naturalist from March 27, 1857, to March 31, 1864. . . . Mr George Gibbs acted as geologist and interpreter, from June 22, 1857, till May 31, 1862. . . . Dr C. B. R. Kennerly served as surgeon and naturalist from March 22, 1857, till his death in 1861. . . .”
BAKER, Marcus. 1900. p. 13-4. (See Bibliography, below.)

“The field work of the Survey of the Northwest Boundary, Archibald Campbell, commissioner, has been completed, furnishing data for a topographical report, embracing the country from the Pacific Coast to the summit of the Rocky Mountains, extending to the north and south of the 49th parallel, north latitude. . . .

“In the department of natural history, reports have been finished, or are in progress, of the following gentlemen: Botany, by Dr John Torrey; Fossil plants, with plates of new species, by Dr J. S. Newberry; Marine Invertebrata, excepting Mollusca, by Dr Wm Stimpson, with plates; recent shells, with plates, by Philip P. Carpenter; Fossil Invertebrata, with plates by F. B. Meek; Fossil Infusoria, by Mr Arthur M. Edwards; Fishes, with the exception of Salmonidae, Theodore Gill; Monograph of the Salmonidae, George Suckley, with plates of new and unfigured species; Birds, by Dr George Suckley and Elliott Coues, with special monographs of the grouse family, by Dr Suckley, and of the gulls, divers, and Grelles, by Mr Coues, illustrated with plates, showing the specific differences of these complicated families; Report on Mammals, by Dr George Suckley, with monographs of some of the smaller animals, by Prof. S. F. Baird; Coleopterous insects, by Dr J. L. Le Conte; Non-coleopterous insects, by Mr P. R. Uhler; several reports on the geology of the country explored, by George Gibbs.” F. V. HAYDEN. *Amer. J. Sc.* v. 84 (ser. 2, v. 34), p. 99-100. July, 1862. See also v. 85 (ser. 2, v. 35), p. 239. Mar. 1863.

A comparatively brief Report was published in the United States documents, in 1869 (see below, REPORTS). The Final Report and the natural history reports were never published, due chiefly to the Civil War, and the misplacing of the MS which were discovered in 1898 (see KLOTZ, under Bibliography, 1917, below). Many of the natural history reports were printed in part in various scientific publications of the day (see below, PAPERS ON NATURAL HISTORY).

A very good extended account of various aspects of the Survey will be found in Baker's account (see Bibliography: 1900, below).

Lt. J. G. Parke's brief Report was published in the Documents,

in 1860. Some of the specimens collected on the Survey were described in the Zoological Reports of the Pacific Railroad Surveys (1853), v. 8, 9 & 10 (q. v.).

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- 1900 BAKER, Marcus. Survey of the northwestern boundary of the United States, 1857-1861. Washington, Gov't print. office, 1900. 78 p. (In U. S. Geol. Surv. Bull. no. 174)
Comprehensive account of the Survey.
- 1917 KLOTZ, Otto. The history of the forty-ninth parallel survey west of the Rocky Mountains. (In Geogr. Rev. v. 3, no. 5, p. 382-87, illus. May, 1917)
Brief account of the accidental discovery of the long sought MS reports of the Survey in July, 1898.

Reports

- 1860 PARKE, J[ohn] G[rubb]. Report . . . Washington, 1860. (In U. S. 36th Cong., 1st sess., Sen. Ex. Doc. no. 16, p. 2-7) Serial no 1031.
Repr. in Baker's Account (U. S. Geol. Surv. Bull. no. 174. p. 66-71. 1900)
Report made Nov. 12, 1859.
- 1869 CAMPBELL, Archibald. Report . . . on the Northwest Boundary Commission and Survey . . . Washington, 1869. (In U. S. 40th Cong., 3rd sess., H. Ex. Doc. v. 7, no. 86. p. 93-6) Serial no. 1381.
Part of the Message from the President of the United States (Grant), concerning the Northwest Boundary Commission. 102 p.

Papers on Natural History

- 1857 KENNERLY, C. B. R. Description of a new species of *Cypselus borealis*, collected on the Northwestern Boundary Survey.
Rd before Phila. Acad. Nat. Sc. (1812), Nov. 24, 1857. In its Proc. v. 9, p. 202-3.
- 1858 SUCKLEY, George. Descriptions of several new species of Salmonidae, from the northwest coast of America.
Rd before N. Y. Lyc. Nat. Hist. (1817), Dec. 6, 1858. In its Annals. v. 7, art. 1, p. 1-10. Dec. 1858.
- 1861 ——— Notices of new species of North American Salmonidae, chiefly in the collection of the Northwest Boundary Commission. . . collected by C. B. R. Kennerly.
Rd before N. Y. Lyc. Nat. Hist. (1817), in June, 1861. In its Annals. v. 7, p. 306-13.
- UHLER, P. R. Descriptions of four species of Hemiptera collected by the Northwest Boundary Survey.

- Rd before Phila. Acad. Nat. Sc. (1812), Sept. 10, 1861. In its Proc. v. 13, p. 284-86.
- MEEK, F. B. Descriptions of new Cretaceous fossils collected by the Northwest Boundary Commission on Vancouver and Sucia Island.
Rd before Phila. Acad. Nat. Sc. (1812), Oct. 8, 1861. In its Proc. v. 13, p. 314-18.
- 1862 NEWBERRY, J. S. Descriptions of the fossil plants collected by George Gibbs, geologist to the Northwest Boundary Commission. . . .
Rd before Bost. Soc. Nat. Hist. (1830), Oct. 1, 1862. In its Jour. v. 7, p. 506-24. Jan. 1863.
- 1864 STIMPSON, William. Description of new species of marine Invertebrata from Puget Sound, collected by the naturalists of the Northwest Boundary Commission. . . .
Rd before Phila. Acad. Nat. Sc. (1812), May 24, 1864. In its Proc. v. 16, p. 153-61.
- 1865 *CARPENTER, P. P. Diagnosis specierum et varietatum novarum Molluscorum, prope sinum Pugetianum a Kennerlio Doctore nuper decesso collectorum.
Rd before Phila. Acad. Nat. Sc. (1812), April 4, 1865. In its Proc. v. 17, p. 54-64.
- 1869 GIBBS, George. Physical geography of the northwestern boundary of the United States.
In Amer. Geogr. Soc. N. Y. Jour. v. 3, p. 134-57, 1872; & v. 4, p. 298-392, illus. pl. 1873.
Rd before Society, Nov. 11, 1869.

ILLINOIS NATURAL HISTORY SOCIETY, BLOOMINGTON (1858)

History

"This Society was organized June 30th, A. D., 1858, and existed simply as an organization until February 22d, A. D., 1861, when it received its charter from the Legislature.

"The plan for a Society devoted to the advancement of science in this state was discussed at an annual meeting of the Illinois Teachers' Association, held at Decatur, in December, 1857, on which occasion a meeting was called, to be held at the State Normal University, in Bloomington, on the day preceding the annual examination. Said meeting—the proceedings of which are published in a preceding volume of the State Agricultural Transactions—resulted in the organization of this Society.

"The demand for this movement seemed to proceed from a want of accurate knowledge in nearly all departments of natural history in the state; and also, from a desire that all facts and discoveries

in a field so vast as Illinois, should be made immediately subservient to the great ends of popular education.

"The first year of our operations was occupied in securing the cooperation of naturalists who lived in various parts of the state. The plans and objects of the Society were heartily endorsed by them, and each began the work peculiar to his own department, at home. This plan has been pursued until the present time, and many portions of the state have been thoroughly explored.

"The results of these surveys and explorations have been placed in the hands of the curator, and during the last year have been arranged in the Museum of the Society, and in the Normal University at Bloomington." WILBER, C. D. Report of the Secretary. (In *Illinois State Agric. Soc. Trans.* v. 4, p. 535-36. 1861.) Also repr. in 2d ed. of this Rept., published separately, p. 7-8.

J. B. Turner was the first President of the Society, and G. P. Rex, its first secretary. Among the vice-presidents were J. H. McChesney, Frederick Brendel, and A. M. Gow. C. D. Wilber later became its active secretary. Meetings were held annually, and a number of auxiliary societies throughout the state were attached to the larger Society.

Papers read before the Society were published for several years in the Transactions of the Illinois State Agricultural Society (see below, PAPERS ON NATURAL HISTORY).

Among its curators and members of committees on natural history matters were: E. Hall, George Vasey, M. S. Bebb, and S. B. Mead, botany; Oliver Everett, J. W. Foster, C. D. Wilber, O. D. W. White, geology and mineralogy; A. H. Worthen, M. Davis, James Shaw, and J. P. Reynolds, palaeontology; B. D. Walsh, Cyrus Thomas, J. A. Sewall, H. W. Boyd, and William Le Baron, entomology; Robert Kennicott, W. D. Eddy, and J. Johnson, herpetology; Adam Nichols, W. H. Githens, and L. Watson, ichthyology; Wm. P. Gearhard, mammology; J. W. Velie, R. H. Holder, and A. M. Gow, ornithology.

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1859 ILLINOIS NATURAL HISTORY SOCIETY. Proceedings . . . for 1858-1862. 1859-63. (In *Illinois State Agric. Soc. Trans.* v. 3-5)

For 1858, in v. 3, p. 637- 61

1859, v. 3, p. 662- 85

1860, v. 4, p. 535-95

1861, v. 4, p. 597-675

1862, v. 5, p. 469-504

Papers for 1860-61, repr. in separate ed., pub. in 1861, see next entry.

Noted, under PAPERS ON NATURAL HISTORY, as 2d ed.

- 1862 ———. Transactions of the . . . edited by C. D. Wilber, secretary . . . second edition. Springfield, Ill., 1861. 194 p. illus. pl. p. 7-8, History of Society; p. 14-6, Constitution and Charter of the Society.

- 1907 FORBES, S[tephen] A[lfred]. History of the former natural history societies in Illinois. (In Science, n. s. v. 26, p. 892-98. Dec. 27, 1907)

Papers on Natural History

- 1858 TURNER, J. B. Microscopic insects. T. v. 3, p. 644-50. Rd June 30.
BRENDL, Frederick. Forests and forest trees. T. v. 3, p. 651-61. Rd June 30.

- 1859 THOMAS, Cyrus. The study of natural history. T. v. 3, p. 665-70. Rd June 30.

BRENDL, Frederick. On meteorology in connection with botanical investigations. T. v. 3, p. 671-75. Rd June 30.

VASEY, George. Mosses of Illinois. T. v. 3, p. 676-79. Rd June 20.

ROE, E. R. Notes on the great drouth in '53 and '54. T. v. 3, p. 680-81. Rd June 20.

THOMAS, Cyrus. Orthoptera of Illinois. T. v. 3, p. 682-85. Rd June 20.

- 1860 TURNER, J. B. Power, force, matter: their diversity, unity, simplicity and harmony, the basis of all science and all knowledge. T. v. 4, p. 545-63. Rd in June.

Also in 2d ed., 1861. p. 7-35.

EVERETT, Oliver. Geology of a section of the Rock River Valley, from Oregon, in Ogle County to Sterling, in Whiteside County. T. v. 4, p. 581-86. Rd June 27.

Also in 2d ed., 1861, p. 53-8.

WILBER, C. D. Mastodon giganteus. T. v. 4, p. 587-92, illus.

Also in 2d ed., 1861, p. 59-64, illus.

BRENDL, Frederick. The water-lily; on the peculiar growth of the water-lily (*Nelumbium luteum*, Willd.) T. v. 4, p. 593-95, 1 pl. Rd in June.

Also in 2d ed. 1861, p. 65-7, 1 pl. [7 fig.]

Gow, A. M. Natural history in schools. T. v. 4, p. 615-25. Rd Dec. 25.

Also in 2d ed., 1861, p. 87-97.

- 1861 HOLDER, R. H. Taxidermy: directions for collecting and preserving specimens in ornithology. T. v. 4, p. 597-603, 5 pl. Rd in July.
Also in 2d ed., 1861, p. 69-75, 5 pl.
- . Birds of Illinois: catalogue. T. v. 4, p. 605-13.
Also in 2d ed., 1861, p. 77-85.
- BLODGETT, J. H. Object lessons. T. v. 4, p. 627-30.
Also in 2d ed., 1861, p. 99-102.
- THOMAS, Cyrus. Notes on Illinois insects. T. v. 4, p. 631-49.
Also in 2d ed., 1861, p. 103-21.
- . Mammals of Illinois; catalogue. T. v. 4, p. 651-61.
Also in 2d ed., 1861, p. 123-33.
- . Plan for a natural history survey. T. v. 4, p. 663-65.
Also in 2d ed., 1861, p. 135-37.
- VASEY, George. Additions to the flora of Illinois. T. v. 4, p. 667-71.
Also in 2d ed., 1861, p. 139-43.
- WILBER, C. D. Museum of the Illinois State Natural History Society. T. v. 4, p. 673-75, 1 pl.
Also in 2d ed., 1861, p. 145-47, 1 pl.
- WALSH, B. D. Insects injurious to vegetation in Illinois. T. v. 5, p. 469-81.
Also in 2d ed., 1861, p. 149-63.
- 1862 ————. The army-worm and its insect foes—the remedy. T. v. 5, p. 482-504, illus.
Also in 2d ed., p. 163-94. The article appeared here first.
- 1863 WINCHELL, Alexander. On the origin of the prairies of the valley of the Mississippi. Rd in June.
In Amer. J. Sc. (1818), v. 88, p. 332-44, 444-45. July, 1864.

MULLAN'S EXPEDITION FROM FORT WALLA-WALLA TO FORT BENTON ON THE MISSOURI RIVER (1858)

History

In connection with the construction of a military road between Fort Walla-Walla and Fort Benton, on the Columbia and Missouri Rivers respectively, Lt. John Mullan made various explorations during a period extending from March, 1858, to September, 1862.

Mullan's Report was published in 1863. Collections of fossils and plants and other specimens were made at intervals. See below for paper describing fossils from Nebraska.

Report

- 1863 MULLAN, John. Report on the construction of a military road from Fort Walla-Walla on the Columbia River to Fort Benton on

the Missouri River. Washington, 1863. 363 p. illus. pl. maps.
(In U. S. 37th Cong., 3rd sess., Sen. Ex. Doc. no 43) Serial no.
1149.

Papers in Society Transactions

- 1862 MEEK, F. B., and HAYDEN, F. V. Descriptions of new Cretaceous fossils from Nebraska Territory . . . collected by Lt. Mullan's Expedition. . . .

Rd before Phila. Acad. Nat. Sc. (1812), Jan. 7, 1862. In its Proc. v. 14, p. 21-8.

POTOMAC-SIDE NATURALISTS' CLUB, WASHINGTON,
D. C. (1858)

History

"On January 29, 1858, with the view of forming a scientific club, especially devoted to natural history, the following gentlemen met at Mr Stimpson's house at seven o'clock in the evening: Mr T. R. Peale, Dr E. Freeman, Prof. G. C. Schaeffer, Dr Charles Girard, Dr F. V. Hayden, Dr J. G. Cooper, Mr Robert Kennicott, Mr William Stimpson, with Professor Turner and Mr W. R. Smith recognized as present in spirit and thus original members."

"They adopted the name of the Potomac-Side Naturalists' Club, with the provisions that: the meetings shall be held every Monday evening; the members shall severally entertain the club in rotation in alphabetical order. The member whose name follows the entertainers shall at each meeting deliver a lecture or read a paper upon some subject in natural science chosen by himself."

"Two very interesting Record Books still remain, with accounts of each meeting, members present, papers read, and discussions following. In the various departments of investigation and discussion, geology most frequently occupied the evening, with botany, zoology and general science following closely after, in frequency of notice. . . ."

"Field meetings were held frequently and botanical novelties exhibited when discovered. In 1864, being the seventh year of the existence of the Club, the second volume of Records was begun, recording the 128th meeting. But on March 26, 1866, the record of the 146th meeting closes with 'adjoined sine die.' " CHICKERING, J. W., Jr. (See Bibliography, below.)

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- 1906 CHICKERING, J[ohn] W[hite], Jr. The Potomac-Side Naturalists' Club, Washington, D. C. (In *Science*. n. s. v. 23, p. 264-65. Feb. 16, 1906)

SIMPSON'S UTAH EXPEDITION (1858)

History

"Under date of December 28, 1858, I had the honor to submit to the headquarters of the Department of Utah, a Map and Report of my explorations and opening under instructions from Gen. A. S. Johnston, commanding the Department, of a new wagon-route, from Camp Floyd to Fort Bridger, Utah, by way of Timpanogos River Canon and White Clay Creek and of my explorations west of Camp Floyd, as far as Short Cut Pass, prefatory to my more extended explorations during the ensuing year for a direct wagon route from that post to Carson Valley." (See below: REPORT (1)—.)

"I have now the honor to submit a Report and Map of my explorations and opening in 1859, of two wagon-routes across the Great Basin of Utah, from Camp Floyd to Carson Valley, by means of which the traveling distance from Camp Floyd to San Francisco, when compared with the old Humboldt River route, has been shortened, in the case of my more southern route, 254 miles."

"The Report will be found also to include the exploration by direction of Gen. Johnston, of a new pass from the Valley of the Timpanogos River over the Uintah range of mountains into the Green River Valley, by means of which, it is believed, a wagon-route can be aimed thence to Denver City, in Kansas, and thus, by this route, in connection with my route across the Great Basin, a more direct route be obtained across the continent to San Francisco than any which at the present time exists. . . ." SIMPSON, J. H. Letter of transmittal, Feb. 5, 1861, p. 7. (See REPORT: (2), below.)

Simpson's Report for his 1858 explorations was made Dec. 28, 1858, and published in 1859 (see below, REPORTS (1)). He was accompanied by Henry Engelmann as geologist of the party.

Simpson's Report for his 1859 explorations was rendered Feb. 5, 1861, but not published until 1876, when it was issued under the direction of the Engineer Bureau. Henry Engelmann continued as geologist during these explorations.

In addition to Reports from Simpson and Engelman (on the geology of the country traversed), descriptions of the collections made were contributed by S. F. Baird, F. B. Meek, Theodore Gill, George Engelman, Garland Hurt and Philip Harry.

Charles S. McCarthy made ornithological collections on the journey. See also MERRILL, (1), p. 502, for critical review of the geological contents of the Report. See also note by F. V. Hayden, in Amer. J. Sc. v. 84 (ser. 2, v. 34), p. 99. July, 1862, regarding the suspension of the printing of the Report. See below the REPORTS and their Contents; and some papers published on the Expedition prior to the publication of the Report in 1876: see PAPERS IN SOCIETY TRANSACTIONS. See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 389-90.

In addition to Engelman, Simpson's staff consisted of Lts. J. L. Kirby Smith and H. S. Putnam, Charles S. McCarthy, taxidermist, H. V. A. Von Beckh, artist, and William Lee and Edward Iagiello, assistants. Engelman was also officially meteorologist and botanical collector.

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(1), 1858 Explorations, Serial no. 984

- 1859 SIMPSON, J[ames] H[ervey]. Report . . . of reconnaissances, etc., in the Territory of Utah, in the months of August, September and October, 1858, under instructions from Brevet Brig. Gen. A. S. Johnston . . . Washington, 1859. 84 p. map. (In U. S. 35th Cong., 2d sess., Sen. Ex. Doc. v. 10, no. 40) Serial no. 984.
Rendered Dec. 28, 1858.

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p. 45-75 ENGELMANN, H[enry]. Preliminary report on the geology of the country between Fort Bridger and Camp Floyd, Utah Territory, and southwest of the latter place, along Capt. J. H. Simpson's routes, 1858. Appx. A. Written Dec. 25, 1858.
p. 75-84 Miscellany.

(2), Final Report, 1859 Explorations, 1876

- 1876 SIMPSON, J[ames] H[ervey]. . . . Report of explorations across the Great Basin of the Territory of Utah for a direct wagon-route from Camp Floyd to Genoa, in Carson Valley, in 1859 . . . made by authority of the Secretary of War, and under instructions from Bvt. Brig. Gen. A. S. Johnston, commanding the Department of Utah. Washington, Gov't print. office, 1876. 518 p. 24 pl. sect. tab. illus. fold. map. diagr. prof. 4°. (U. S. War Dept. Engineer Dept.)

Originally submitted Feb. 5, 1861.

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- p. 7- 10 SIMPSON, J. H. Letter of transmittal.
 p. 11- 38 ————. History of explorations within the Great Basin of the Territory of Utah, from the time of Father Escalante, in 1776, to the present period (1861), and a general description of the country.
 p. 39-148 ————. Report and Journal.
 Appendixes
 p. 149- 55 ————. Itineraries of wagon-routes. Appx. A, B, C.
 p. 157- 66 ————. Astronomical and geographical positions. Appx. D.
 p. 167-207 ENGELMANN, Henry. Barometrical and meteorological observations. Dec. 5, 1860. Appx. E.
 p. 209- 13 SIMPSON, J. H. Table of distances. . . . Appx. F.
 p. 215- 20 ————. Estimate of appropriations needed for roads. Appx. G.
 p. 221- 30 Magnetic observations and results. Appx. H.
 p. 231- 41 ————. Railroad routes from Atlantic to Pacific Ocean. Appx. HH.
 p. 243-336 ENGELMANN, Henry. . . . Report on the geology of the country between Fort Leavenworth, K. T., and the Sierra Nevada near Carson Valley. Appx. I. Written July 19, 1860 & Dec. 29, 1875.
 p. 337- 73 MEEK, F. B. . . . Report on the palaeontological collections of the Expedition. Appx. J. 5 pl. [40 fig.] Written May 23, 1860 & revised Nov. 8, 1875.
 p. 368-73 Catalogue of the remains contained in the collection.
 p. 375- 81 BAIRD, S. F. . . . Ornithology: a list of birds collected by Charles S. McCarthy. Appx. K.
 p. 383-431 GILL, Theodore. . . . Report on ichthyology. Appx. L. 9 pl. [50 fig.] Written Dec. 11, 1860.
 p. 433- 47 ENGELMANN, George. . . . Report on the botany of the expedition. Appx. M. 3 pl. Written Dec. 31, 1860.

- p. 449- 55 HURT, Garland. Population and resources of the territory of Utah. Appx. N.
- p. 457- 64 ————. . . . Indians of Utah. . . . Appx. O.
- p. 465- 74 COLLINS, C. R. Report of the languages of the different tribes of Indians of Utah. . . . Appx. P.
- p. 475- 86 KERN, E. M. . . . Journal of an exploration of Mary's or Humboldt River, Carson Lake and Owens River and Lake in 1845. Appx. Q.
 Undertaken while under the command of Fremont
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- p. 487- 95 HARRY, Philip Journeys of Father Escalante, from Santa Fe to Utah Lake and the Moqui Villages in 1776. Appx. R.
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- 1862 ENGELMANN, Henry. Topaz in Utah.
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- ENGELMANN, George. Additions to the Cactus flora of the Territory of the United States.
 Rd before Acad. Sc. St. Louis (1856), Mar. 17, 1862. In its Trans. v. 2, p. 197-204.

TEXAS GEOLOGICAL SURVEYS (1858)

History

By virtue of an Act passed February 10th by the State Legislature, a geological survey of the state of Texas was authorized. It was also intended as an agricultural survey.

Benjamin Franklin Shumard was appointed state geologist, Aug. 28, 1858; George Getz Shumard, assistant geologist; W. P. Riddell, chemist and assistant geologist; A. P. Roessler, topographer; Caleb G. Forshey and Swante Palm, meteorologists.

Active work was begun in January, 1859. S. B. Buckley was added to the staff early in 1860 in the capacity of collector of

plants. Shumard was removed as state geologist by Gov. Houston for political reasons in the late fall of 1859. Francis T. Moore was appointed in his place.

With the outbreak of the Civil War, the Survey was suspended and reports requested of both Shumard and Moore. Buckley was appointed to the state geologist's position shortly after the close of hostilities and rendered a Report in 1866. Shumard's only Report, a brief one, was published in 1859. (See REPORTS, below.)

See MERRILL, (1), p. 487-88, 508-9, for criticism of the geological aspects of the Survey; and the thorough account by HILL (see BIBLIOGRAPHY, below). See also MERRILL. First 100 yrs. Amer. Geol. 1924. p. 371-72, 401-2.

Shumard published a number of papers concerning the geology of the state which were published in the organs noted below under PAPERS, q. v.

According to Merrill (see Bibliography: 1920, below), the state expended \$15,073 on the surveys under Shumard and Moore.

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See also Amer. J. Sc. ser. 3, v. 33, p. 73-5. 1887.
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- 1860 ———. State house artesian well at Austin. (In Texas Almanac. 1860. p. 161-62.)
- . Descriptions of new Cretaceous fossils from Texas.
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Abstr. in (Texas Almanac. 1861. p. 203-5).
- . Observations upon the Cretaceous strata of Texas.
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- . Descriptions of five new species of Gasteropoda from the coal measures, and a Brachiopod from the Potsdam sandstone of Texas.
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- SHUMARD, B. F. Descriptions of new Palaeozoic fossils.
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- GRAY, Asa. A report upon S. B. Buckley's "Description of plants: no. 3, Gramineae". . . .
Rd before Phila. Acad. Nat. Sc. (1812), Aug. 5, 1862. In its Proc. v. 14, p. 332-37.

WYOMING HISTORICAL & GEOLOGICAL SOCIETY,
WILKES-BARRE, PA. (1858)

History

This Society was organized on February 11, 1858, at the Old Fell Tavern, Northampton Street, Wilkes-Barre, Pa., "to commemorate the successful experiment made by the Hon. Jesse Fell, Feb. 11, 1808, of burning the Wyoming anthracite coal in a domestic grate."

Its first volume of proceedings was published in 1858-1884. See below under BIBLIOGRAPHY, the History of the Society.

Bibliography

- 1858 WYOMING HISTORICAL & GEOLOGICAL SOCIETY. Proceedings and collections . . . Wilkes-Barre, Pa. 1858-date. v. 1-date.
- 1907 ————. History, charter, by-laws, and list of officers, members . . . of the . . . Wilkes-Barre, Pa., 1907. 44 p. illus. pl. port.

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Papers on Natural History

- 1858-69 MAXWELL, V. L. Lectures on coal. Proc. v. 1, no. 1, p. 1-53. 1858-69.

ENTOMOLOGICAL SOCIETY OF PHILADELPHIA (1859)

History

"On February 14, 1859, James Ridings, George Newman and Ezra Cresson, met together at the residence of the latter, no. 728 Erie Street, Philadelphia, with the view of forming a Society "whose object shall be the advancement of entomological science, by ascertaining the name, locality and habits of insects found within the United States."

"After discussing the matter thoroughly, they decided to invite to the house on the evening of the 22d of the same month, such of their acquaintances as are interested in the study, and who would likely become members . . . On February 22, 1859, the meeting was held with the following persons present: Thomas B. Wilson, Robert Jack, James Ridings, Thomas B. Ashton, George Newman, Charles Wilt, E. T. Cresson, Louis Schneider, J. H. B. Bland, William Wolter, J. W. McAllister, Henry Feldman, George Hill, Thomas Cox, and John Pearsall . . .

"After a full discussion of the subject, it was unanimously resolved to form such a society . . . and a committee appointed to draft a constitution and by-laws and propose a suitable name for the Society. The Committee made a full report at a meeting held March 1, 1859, and suggested the name, "The Entomological Society of Philadelphia," which report was adopted . . ." From CRESSON. p. 13-4. (See Bibliography: 1909, below).

"During the year 1860, Mr E. T. Cresson presented his entire collection of Coleoptera. In 1863, Mr W. H. Edwards presented a large and beautiful collection of European moths. On November 14th, 1864, the thanks of the Society were voted to Dr T. B. Wilson for his liberal donation of Coleoptera, Hymenoptera and Hemiptera, being the original collections of Prof. Felipe Poey. In June, 1865, the executor of Dr T. B. Wilson, deceased, presented the Doctor's collection to the Society. This valuable gift numbered 12,012 Coleoptera, 5,347 Diptera and enough of the remaining orders to make a grand total of 18,873 species . . ." CRESSON. p. 37-8.

The publication of the Proceedings of the Society was begun in 1861. In 1867, the name of the Society was changed to that of the present "American Entomological Society." An excellent history of the first half-century, is noted in the Bibliography, below, 1909: CRESSON.

The officers during the period 1859-65, were as follows: President: 1859-60, J. L. Le Conte; 1861-62, George Newman; 1863-65, J. H. B. Bland; Vice-president: James Ridings, 1859; 1860, George Newman; 1861-62, J. H. B. Bland; 1863-64, Charles F. Parker; 1865-68, William S. Pine; Treasurer: 1859-62, Charles Wilt; 1863-73, J. W. McAllister; Corresponding secretary: 1859-74, E. T. Cresson.

Below are given the dates of the publication of the PROCEEDINGS and the PAPERS ON NATURAL HISTORY contained in the volumes.

On October 30, 1865, the Society issued the first number of the "Practical Entomologist," published monthly for free distribution, edited by Messrs Cresson, McAllister, Walsh and Grote. Only two volumes were published.

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- 1862 ———. Charter and by-laws. Phila. 1862. 11 p.
- 1865 ———. Memoir of Thomas B. Wilson . . . Phila. 1865. 38 p.
 Contains a history of the founding of the Society and Wilson's important contributions to it.
- . The Practical entomologist. Phila. [1865-67.] 2 v. 4.^o
- 1868 AMERICAN ENTOMOLOGICAL SOCIETY. Transactions . . . for 1868-date. Phila. 1868-date. v. 1-date.
- 1893 ASHTON, Thomas B. On the early history of the Entomological Society of Philadelphia (now the American Entomological Society). (In Ent. News. v. 4, p. 145-48. May, 1893)
- 1909 CRESSON, Ezra T[ownsend]. A history of the American Entomological Society, Philadelphia, 1859-1909, prepared by request of the Society . . . with an introduction by the Rev. Henry C. McCook. Phila. The Society, 1909. 60 p. 3 port.
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| no. 2, | p. 25- 39, | June-Aug. | |
| no. 3, | p. 41- 72, | Sept.-Oct. | |
| no. 4, | p. 73-102, | Nov.-Dec. | |
| no. 5, | p. 103- 44, | Jan.-Feb. | 1862 |
| no. 6, | p. 145- 88, | March-April | |
| no. 7, | p. 189-224, | May-July. | |
| no. 8, | p. 225- 59, | Aug.-Sept. | |
| no. 9, | p. 261-311, | Oct.-Dec. | |
| no. 10, | p. 313- 81, | Jan.-Feb. | 1863 |
- v. 2, for March 1863-March, 1864, pub. 1863-64. 4+562 p. 11 pl.
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p. 209-14,	Feb.
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- 1861 CRESSON, E. T. Catalogue of the Cicindelidae of North America. P. v. 1, p. 7-20. Rd April 8.
- UHLER, P. R. Descriptions of a few new species of Hemiptera; and observations upon some already described. P. v. 1, p. 21-4. Rd April 8.
- HORN, G. H. Notes on the habits of some coleopterous larvae and pupae. P. v. 1, p. 28-30, 43-4. Rd June 10 & Aug. 12.
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NORTON, Edward. A description of several new Hymenoptera. P. v. 1, p. 198-200. Rd April 14.

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GRÖTE, A. R. Additions to the catalogue of U. S. Lepidoptera. P. v. 1, p. 218-19, 345-47. Rd May 12 & Dec. 8.

EDWARDS, W. H. Descriptions of certain species of diurnal Lepidoptera found within the United States, figured in Doubleday's "Genera" but undescribed. P. v. 1, p. 221-24. Rd June 9.

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*OSTEN-SACKEN, R. Additions and corrections to the paper entitled: "On the Cynipidae of the North American oaks and their galls." P. v. 1, p. 241-59. Rd Aug. 11.

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EDWARDS, W. H. Description of certain species of diurnal Lepidoptera found within the limits of the United States and British America; no. 2. P. v. 2, p. 78-82. Rd June 8.

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No. 2 rd Nov. 9, 1863 (q.v.)

*HAGEN, Hermann, and WALSH, B. D. Observations on certain North American Neuroptera, by H. Hagen, of Königsberg, Prussia; translated from the original French MS, and published by permission of the author, with notes and descriptions of about twenty new North American species of Pseudoneuroptera. P. v. 2, p. 167-272. Rd Aug. 10.

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CRESSON, E. T. On *Bombus pennsylvanicus*, De Geer, *B. separatus* and *B. virginicus*. P. v. 2, p. 164-66. Rd Oct. 12.

BLAKE, C. A. Description of a supposed new genus and species of Saturniidae from the Rocky Mountains. P. v. 2, p. 279. Rd Oct. 12.

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BASSETT, H. F. Descriptions of several supposed new species of Cynips, with remarks on the formation of certain galls. P. v. 2, p. 323-33. Rd Nov. 9.

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1864 CRESSON, E. T. Descriptions of several new species of North American Apidae. P. v. 3, p. 38-43. Rd Jan. 11.

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GROTE, A. R. Description of a new species of North American Gortyna [*cerussata*]. P. v. 2, p. 431-32. Rd Feb. 8.

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WALSH, B. D. On dimorphism in the hymenopterous genus *Cynips*; with an appendix, containing hints for a new classification of Cynipidae and a list of Cynipidae, including descriptions of several new species, inhabiting the oak-galls of Illinois. P. v. 2, p. 443-500, illus. Rd Feb. 8.

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REAKITT, Tryon. Descriptions of three new species of Limacoides. P. v. 3, p. 250-52. Rd Aug. 8.

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EDWARDS, W. H. Description of the female of *Argynnis Diana*. P. v. 3, p. 431-34. Rd Oct. 10.

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BRENDEL, Emil. On some new species of *Pselaphidae*. P. v. 5, p. 28-32. Com. July 10.

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BLAKE, C. A. Description of a new species of Cuban Lepidoptera. P. v. 4, p. 313-14.

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MACOMB EXPEDITION IN NEW MEXICO, UTAH &
COLORADO (1859)

History

Early in 1859, Capt. J. N. Macomb was ordered to make explorations of the country in New Mexico, Utah and Colorado, covered in an expedition from Santa Fe, New Mexico, to the junction of the Grand and Green Rivers of the Colorado. The work was carried on during the summer of 1859.

Macomb was accompanied by J. S. Newberry as the naturalist and the geologist of the expedition. Macomb made brief reports Nov. 11, 1860, and Nov. 27, 1861, but the intervention of the Civil War delayed the final appearance of the official Report until 1876.

Newberry's Report was ready for printing May 1, 1860, but decided to delay its printing until the completion of his geological map. The outbreak of the War postponed the appearance of this Report until 1876.

The Expedition was also known as the San Juan Exploring Expedition. See also MERRILL, (1), p. 478-80, for a criticism of Newberry's work, and the map, showing the route followed by the Expedition. F. B. Meek described the fossils collected. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 362-64.

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| p. | 5- 8 | MACOMB, J. N. | Report, made Nov. 11, 1860. |
| p. | 8 | _____ | Report, made Nov. 27, 1861. |
| p. | 9-118 | NEWBERRY, J. S. | Geological report. 8 pl. [48 fig.]
Report rendered June 1, 1875. Ready in May, 1860. |
| p. | 119- 33 | MEEK, F. B. | Descriptions of the Cretaceous fossils collected in the San Juan Exploring Expedition. |
| p. | 135- 48 | NEWBERRY, J. S. | Descriptions of the Carboniferous and Triassic fossils collected. . . |

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MINNESOTA GEOLOGICAL SURVEYS (1859)

History

In 1859, the first legislature of Minnesota authorized the reprinting of Prof. Edward Daniels' "Reports on the geology of the state of Wisconsin" of 1854 and 1858; since the state had theretofore been part of Wisconsin. These were reprinted in 1860 in his "Sketch of the lead region."

By an Act approved March 10, 1860, the legislature authorized a "Report on the geology of the state, and the submission of a plan for a thorough geological survey." Charles L. Anderson, with Thomas Clark as his assistant, was appointed to make this Report, which was rendered in 1861.

In 1864 Augustus H. Hanchett was appointed state geologist, with Thomas Clark as his assistant. Hanchett's "Report" was published in 1865.

In 1865, H. H. Eames succeeded Hanchett and presented two brief reports in 1866. In 1865 N. C. D. Taylor was directed to explore the mineral lands of the valley of the St. Croix. His "Report" was presented in 1866.

See also HAYES, p. 80-2, (U. S. Geol. Surv. Bull. no. 465), for brief history of the state geological surveys. See also MERRILL, (1), p. 530. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 429.

See below under the BIBLIOGRAPHY, the histories by Merrill (1920), and those by N. H. Winchell. About \$4,000 was expended on the various surveys prior to 1865.

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- 1865 HANCHETT, Augustus H., and CLARK, Thomas. Report of the state geologist, together with the physical geography, meteorology and botany of the northeastern district of Minnesota, by Thomas CLARK. St. Paul, 1865. 82 p.
Preface, dated Nov. 13, 1864. Instructions given July 12, 1864.

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p. 73-82.

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Another ed. 1867.

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TAYLOR, N. C. D., and HALL, James. On the copper district of Kettle River incorporating Mr. James Hall's estimate of the copper prospects of that district. St. Paul, 1866. 2 p. (In Exec. Doc.)

WHITTLESEY, Charles. Report of explorations in the mineral regions of Minnesota, during the years 1848, 1859 and 1864. Cleveland, 1866. 54 p.

MUSEUM OF COMPARATIVE ZOOLOGY, HARVARD UNIVERSITY, CAMBRIDGE, MASS. (1859)

History

"Since the connection of Prof. Agassiz with the scientific department of Harvard University, he has been actively devoted as is well known, to collecting zoological specimens and laying the foundation of a great museum. The collections already made by him or through his agency and in great part at his own expense, are very large. The interest felt in this movement has been general throughout the country, and has recently taken a fresh start which is destined to lead to the most important results.

"The late Francis C. Gray of Boston—a gentleman extensively known for the depth and variety of his knowledge in many departments of literature, and for his liberal spirit in promoting schemes for the public good, was strongly attached to the study of the natural sciences, during the last years of his life, and was in habits of intimate and critical association with Professor Agassiz.

"This distinguished gentleman died two years ago. He left by will . . . to Harvard College . . . the further sum of fifty thousand dollars (50,000), the income to be applied to establishing and maintaining a MUSEUM OF COMPARATIVE ZOOLOGY, at Harvard College, not to be appended to any other department, but to be under the charge of an independent faculty, responsible only to the Corporation and Overseers. No part of said income is to be expended for real estate or the payment of salaries . . .

"... The Faculty shall consist of Rev. Dr. James Walker; Prof. Louis Agassiz, Director of the Museum; John Bigelow; Prof. O. W. Holmes; and Jeffries Wyman . . ." From AMER. J. SC. v. 77 (ser. 2, v. 27), p. 295–99. March, 1859.

"The Museum had its origin in the zoological collections accumulated by Professor Agassiz, which were purchased in 1852 for

Harvard College at a cost of \$12,000, raised by private subscriptions. In 1858, the Corporation of Harvard University made a small appropriation (monthly allowance) for the care of the collection. In 1859, Professor Agassiz obtained a grant from the legislature of Massachusetts of \$100,000; at the same time, \$71,125 was raised by private subscription for the Museum.

"The Museum was incorporated in 1859, and received through Mr Gray the sum of \$50,000 left to him by F. C. Gray . . . Construction of building was begun in 1859 . . . Money was paid in three installments in 1861, 1863 and 1864." P.M.REA. Buffalo Soc. Nat. Sc. Bull. v. 10, p. 117-18. 1910.

Beginning with 1859, Annual Reports of the Trustees and the Director, were published. In 1863, the Bulletin began to be published. In 1865, the first volume of Memoirs was issued.

Between 1859 and 1866, Agassiz was assisted in the curatorships by P. R. Uhler, N. S. Shaler, Alexander Agassiz, J. G. Anthony, J. A. Allen, Louis Agassiz, A. S. Bickmore, A. S. Packard, Jr., F. W. Putnam, A. E. Verrill, S. H. Scudder, N. B. Shurtleff, William Gray.

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RAYNOLDS' EXPLORATION OF THE YELLOWSTONE
(1859)*History*

In 1859, Capt. W. F. Raynolds was instructed as follows: "Under clauses of the military appropriation acts, providing for surveys for military defences, geographical explorations and reconnaissances for military purposes, I am directed by the Secretary of War to instruct you to organize an expedition for the exploration of the region of country through which flow the principal tributaries of the Yellowstone River, and of the mountains in which they, and the Gallatin, and Madison forks of the Missouri have their source."

"The objects of this expedition are to ascertain, as far as practicable, everything relating to the numbers, habits, and disposition of the Indians inhabiting the country, its agricultural and mineralogical resources . . ."

The sum of \$60,000 and the employment of eight assistants was authorized. The expedition left St. Louis, May 28, 1859, and remained in the field until October 4, 1860. F. V. Hayden was selected as surgeon and naturalist of the party. M. C. Hines was assistant naturalist; J. H. Snowden, Lt. H. E. Maynadier, John Mullins and J. D. Hutton acted in various capacities.

The publication of Raynolds' "Final Report" was delayed because of his protracted illness and his service during the Civil War. It was submitted July 1, 1867, and published in 1868.

"The progress of this Report has been suspended for a time, the commanding officer being on duty as topographical engineer of Gen. Rosencrantz's staff. A map of the region explored has been prepared, and the astronomical, barometrical, and meteorological observations, with profiles, etc., are completed.

"The following reports are nearly ready: Reports on the geology of the district examined, by F. V. Hayden; Palaeontology, by Prof. Leidy, J. S. Newberry, and Messrs Meek and Hayden; Zoology: Mammals, by F. V. Hayden; Birds, by Elliott Coues; Fishes, by Theodore Gill; Botany, by Messrs Engelmann, Dewey, Sullivant, and Tuckerman; also a Report on the Ethnography and Philology of the Indian Tribes of the Missouri Valley, by F. V. Hayden (finished)." F. V. HAYDEN. *Amer. J. Sc.* v. 84, (ser. 2, v. 34). p. 100. July, 1862.

For critical notes on the geological contents of the report, see MERRILL, (1), p. 589-91. For papers published before the appearance of the official report, see below, PAPERS IN SOCIETY TRANSACTIONS. See also MERRILL. First 100 yrs Amer. Geol. 1924. p. 504-6.

Hayden's Reports were published prior to the final report, and will be found below under PAPERS IN SOCIETY TRANSACTIONS.

Report

- 1868 RAYNOLDS, W[illiam] F[ranklin]. . . . Report on the exploration of the Yellowstone and the country drained by that river. Washington, 1868. 174 p. maps. (In U. S. 40th Cong., 2d sess., Sen. Ex. Doc. v. 2, no. 77) Serial no. 1317.
Report rendered July 1, 1867.

CONTENTS:

- p. 2- 18 RAYNOLDS, W. F. Official report.
p. 18-127 ———. Journal. ch. 1-6.
p. 95-103 HINES, C. M. Geological notes by C. M. Hines, attached to H. E. Maynadier's command, 1859-60, from time of separation of the commands on Tullocks Creek to Captain Raynolds' trail near the head of the Crazy Woman's Fork of Powder River.
p. 127- 54 MAYNADIER, H. E. Report on the route between the Yellowstone and Platte River, 1859. Jan. 27, 1860.
p. 154- 61 SNOWDEN, J. H. Report on explorations from the Platte to the headwaters of the Sheyenne. Written Oct. 18, 1859.
p. 161- 70 MULLINS, John. Report on route from Fort Benton to Fort Union between the Missouri and Yellowstone Rivers. Written July 18, 1860.
p. 171- 74 HUTTON, J. D. Reconnaissance for a wagon road from the Platte to Powder River, 1860.

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- 1861 HAYDEN, F. V., and RAYNOLDS, W. F. Sketch of the geology of the country about the headwaters of the Missouri and Yellowstone Rivers by Dr F. V. Hayden . . . with introductory remarks (letter) by Capt. W. F. Raynolds. Written Jan. 20, 1861.
In Amer. J. Sc. (1818), v. 81 (ser. 2, v. 31), p. 229-45. Mar. 1861.
HAYDEN, F. V. On the geology and natural history of the Upper Missouri.
Rd before Amer. Phil. Soc. (1769), July 19, 1861. In its Trans. n. s. v. 12, art. 1, p. 1-218. illus. col. map. 1863.

For contents, see WARREN'S SIOUX EXPED. (1855), PAPERS IN SOCIETY TRANSACTIONS: 1861: Hayden.

Constitutes Report of progress for this expedition, WARREN'S EXPLORE. IN NEBRASKA & DACOTAH (1856), & WARREN'S SIOUX EXPED. (1855)

MEEK, F. B., and HAYDEN, F. V. Descriptions of new Lower Silurian (Primordial), Jurassic, Cretaceous, Tertiary fossils, collected in Nebraska by the Reynolds' . . . Expedition . . . with some remarks on the rocks from which they were obtained.

Rd before Phila. Acad. Nat. Sci. (1812), Dec. 3, 1861. In its Proc. v. 13, p. 415-47.

- 1862 HAYDEN, F. V. Contributions to the ethnography and philology of the Indian tribes of the Missouri Valley.

Rd before Amer. Phil. Soc. (1769), May 16, 1862. In its Trans. n. s. v. 12, p. 231-461, 2 pl. map.

Extract in Amer. J. Sc. v. 84 (ser. 2, v. 34), p. 57-66. July, 1862.

———. Some remarks in regard to the period of elevation of those ranges of the Rocky Mountains, near the sources of the Missouri River, and its tributaries.

Extract from Report of the Expedition.

In Amer. J. Sc. (1818), v. 83 (ser. 2, v. 33), p. 305-13. May, 1862.

- 1874 COUES, Elliott. . . Birds of the Northwest: a hand-book of the ornithology of the region drained by the Missouri River and its tributaries. Wash. Gov't print. off., 1874. xi+791 p. (In U. S. Geol. Surv. Terr. F. V. Hayden, Geol.-in-charge. Misc. Pub. no. 3)

Rept. prepared in 1862 of collections made by Hayden with additions by Coues.

SPRINGFIELD (MASS.) MUSEUM OF NATURAL HISTORY (1859)

History

"In the autumn of 1859, Reuben A. Chapman, Daniel L. Harris, John L. King, and George A. Otis, Jr., four of Springfield's leading men, held several meetings at the house of Mr Harris to discuss the feasibility of establishing in Springfield (Mass.) a museum of natural history and curiosities, and the best mode of carrying out such a project, if it was a practicable one . . .

"It was agreed also that the illustration of the natural history of our immediate vicinity should be made a prominent object.

"As great efforts were being made at the time in behalf of the library association, it was thought best not to attempt to divide the public interest, but rather to unite the two enterprises . . .

“At a meeting of several gentlemen at the house of Daniel L. Harris, November, 1859,—

“1. Voted, that in our opinion, there ought to be in this city, a repository where specimens of natural history in all its departments, works of art, and valuable curiosities of every kind, can be collected and preserved, and the library association is a suitable body to establish such a repository.

“2. Voted, that it is especially desirable to obtain as far as may be practicable complete series of illustrations of the natural history of this county.”

“Records give evidence of but one earlier attempt to make an exhibition of natural history specimens. This was in connection with the ‘Springfield Institute’ or ‘Young Men’s Institute’ a society which was founded in 1843 for ‘the betterment of its members.’ This Society was absorbed by the City Library Association, which was formed November 27, 1857, and the remains of the mineralogical collections of the Springfield Institute formed a part of the first installment in the new museum . . .

“Besides a really surprising number of curiosities from distant countries, of Indian relics, and of objects of antiquarian interest, the museum possessed 6,000 natural history specimens . . . One of the most pleasing features of the museum was the ornithological cabinet of which Roger B. Hildreth was curator. Its rapid increase was mainly due to the zealous labors of Caleb W. Bennett and Lucius L. Hyde . . .

“Of the collection of shells, which included 750 species and was in charge of Dr George A. Otis, Jr., the Republican said:

“ ‘This department possesses numerous duplicates, and persons having collections of shells are invited to make exchanges . . .

“ ‘The Crustacea, insects, and radiates in the museum are foreign. The trustees earnestly desire that some of our young people should take charge of these departments . . .

“ ‘The Museum has a respectable cabinet of fossils, which have been carefully studied by Mr H. O. Marcy. A large proportion of them were collected by Mr Marcy in a geological tour in New York and belong to the Silurian system . . .

“ ‘The mineralogical cabinet in charge of Rev. F. Tiffany is in a very creditable condition. It has been carefully arranged on Dana’s system, by the curator, assisted by Messrs Rice, Marcy and Fay . . . Mr B. W. Wright of Marquette, Illinois, has also made

handsome donations to this department, and has presented a highly interesting series of minerals from Lake Superior . . .'

"Another important donor of natural history material was Rev. H. J. Bruce, a missionary in India." Extracts from JOHNSON, p. 12-22 (see below)

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WILMINGTON INSTITUTE, WILMINGTON, DELAWARE (1859)

History

The Wilmington Institute was incorporated in January, 1859, having been the outgrowth of various previous Wilmington institutions formed for the promotion of the arts and sciences. While aiming principally to develop a library, it had a sub-committee on science, whose purpose was to encourage the interest in the natural sciences. Lectures on scientific subjects were given under its auspices. It took under its direction the publication of Tatnall's "Botanical Catalogue" (see below). It published annual reports. The presidents of the Institutes between 1859 and 1866 were Joshua T. Heald, William Canby, Samuel Biddle, William S. Hilles, George W. Bush, William R. Bullock, J. F. Vaughan and John H. Adams. It inherited the funds and books left over by the extinct Botanical Society of Wilmington (1842), q.v.

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Paper on Natural History

- 1860 TATNALL, Edward. Catalogue of the phaenogamous and filicoid plants of New Castle County, Delaware, arranged according to the natural system with the synonyms of modern authors. Wilmington, Del., 1860. 112 p.

See also Amer. J. Sc. ser. 2, v. 31, p. 130. 1861.

ZOOLOGICAL SOCIETY OF PHILADELPHIA (1859)

History

"The object of this corporation, the Zoological Society of Philadelphia, shall be the purchase and collection of living wild and other animals, for the purpose of public exhibition at some suitable place in the city of Philadelphia for the instruction and recreation of the people . . ." Fairmount Park was dedicated by the people for the use of the objects of the Society.

The officers were William Camac, president; J. L. Le Conte, corresponding secretary; John Cassin, W. S. Vaux, managers.

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Approved March 21, 1859. Another ed. 1872.

Copy seen in Library of Congress.

HALL'S EXPEDITIONS TO THE ARCTIC REGIONS (1860)

History

Charles Frederick Hall conducted two expeditions to the Arctic regions during the sixties of the nineteenth century. The first left May 29, 1860, and returned September 13, 1862, the chief purpose of which was to discover traces of the party under Sir John Franklin.

The second was begun June 30, 1864, and ended September 26, 1869, although preparations had been made since 1862, following Hall's return from the first expedition.

Geological and other collections were made, which were described by B. K. Emerson. For the narratives of the expeditions see below, BIBLIOGRAPHY.

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- 1865 HALL, Charles Francis. Arctic researches and life among the Esquimaux; being the narrative of an Expedition in search of Sir

John Franklin in the years 1860, 1861, and 1862. . . . N. Y. Harper, 1865 (c. 1864). 595 p. 103 illus. pl. map.

p. 594-95, Mineralogical and geological specimens. (see above 1863.

- 1879 NOURSE, J[oseph] E[verett]. Narrative of the Second Arctic Expedition made by Charles F. Hall: his voyage to Repulse Bay, sledge journeys to the Straits of Fury and Hecla and to King William's Land, and residence among the Eskimos during the years 1864-69 . . . edited . . . under orders of the Secretary of the Navy. Washington, Gov't print. office, 1879. 6 + 50 + 644 p.
p. 553-83, Appx. 3. EMERSON, B. K. On the geology of Frobisher Bay and Field Bay: descriptions of the collections made by C. F. Hall during the first expedition in the Arctic Regions: 1860-1862.

- 1884 ———. American explorations in the ice zones; the expeditions of De Haven, Kane, Rodgers, Hayes, Hall, Schwatka, and De Long . . . with a brief notice of the Antarctic Cruise under Lieut. Wilkes . . . prepared chiefly from the official sources . . . Bost. Lothrop, 1884. 578 p. illus.

Hall's Exped., 1st Voyage, p. 161-98; 2d Voyage, p. 199-286.

HAYES' ARCTIC EXPEDITIONS (1860)

History

In 1860, Isaac Israel Hayes, a member of Kane's Expedition to the Arctic Regions (1852), q.v., made a voyage to the Arctic Regions, which lasted through 1861. Hayes' Expedition, although not a federally supported exploring party, had the support and assistance of a number of the scientific institutions of the day.

Preparations were begun in June, 1860. The Smithsonian Institution furnished materials for collecting and preserving natural history specimens. For papers describing the collections made, see below PAPERS ON NATURAL HISTORY.

Hayes' personal "Narrative" was published in 1867 (see Bibliography, below).

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Another ed., 1867. 25 + 387 p. Appx. contains an account of the preparations made for his 1860 Expedition.
appx. (1st ed.), p. 355-75, Proceedings of Scientific societies and letters relative to Dr Hayes' proposed Arctic Expedition.

- 1867 ———. The open polar sea: A narrative of a voyage of discovery towards the North Pole, in the schooner "U. S." N. Y. Hurd & Houghton, 1867. 24+454 p. illus. pl. diagr. port. maps. History of voyage, etc., p. 1-12.
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ch. 5, p. 132-60, deal with Hayes' Explorations.

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Rd before Amer. Phil. Soc. (1769), Dec. 6, 1861. In its Proc. v. 8, p. 381-93.
- 1862 KILVINGTON, Robert. Cultivation of Arctic plants brought by Dr Hayes . . .
Rd before Phila. Acad. Nat. Sc. (1812), Oct. 7, 1862. In its Proc. v. 14, p. 482.
- HAYES, I. I. Lecture on Arctic explorations.
In Smith. Inst. Ann. Rept. for 1861. Wash. 1862. p. 149-60.
- 1863 DURAND, Elias, JAMES, T. P., and ASHMEAD, Samuel. Enumeration of the Arctic plants collected by Dr I. I. Hayes in his explorations of Smith's Sound, between parallels 78th and 82d north latitude during . . . July, August and September, 1861.
Rd before Phila. Acad. Nat. Sc. (1812), March, 1863. In its Proc. v. 15, p. 93-6.
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Rd before Phila. Acad. Nat. Sc. (1812), May 12, 1863. In its Proc. v. 15, p. 138-42.
- 1865 MEEK, F. B. Preliminary notice of a small collection of fossils found by Dr Hayes, on the west shore of Kennedy Channel, at the highest northern localities ever explored.
In Amer. J. Sc. (1818), v. 90 (ser. 2, v. 40), p. 31-4. July, 1865.
- 1867 HAYES, I. I. Physical observations in the Arctic Seas made on the west coast of North Greenland, the vicinity of Smith's Strait, and the west side of Kennedy Channel during 1860 and 1861. Wash., June, 1867. 11+271 p. 4°. (In Smith. Inst. Contr. to Knowledge. v. 15) Pub. no. 196.

ISTHMUS OF CHIRIQUI EXPEDITION (1860)

History

By an act of June 22, 1860, Captain F. Engle was ordered by the Secretary of the Navy "To examine into and report upon the

quality and probable quantity of coal to be found there upon the lands of the Chiriqui Improvement Co., upon the character of the harbors of Chiriqui lagoon and Golfito; upon the practicability of building a railroad across said Isthmus, so as to connect said harbors . . .” ENGLE, F. p. 17.

The exploration under Engle took place between August 26 and November 11, 1860. He was accompanied by John Evans, geologist, William N. Jeffers, hydrographer and J. S. C. Morton, topographer. Engle's Report was submitted Jan. 6, 1861, and the manuscript published the same year. See also below PAPERS IN SOCIETY TRANSACTIONS.

Report

- 1861 ENGLE, F[rederick]. Reports of the Chiriqui expedition and commission. Washington, 1861. 70 p. (In U. S. 36th Cong., 2d sess., H. Ex. Doc., v. 6, no. 41) Serial no. 1097.

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 p. 42- 5 JEFFERS, W. N. Report of hydrographer.
 p. 45-55 EVANS, John. Geological report. Written Dec. 31, 1860.

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- 1860 GABB, W. M. Descriptions of some new species of Tertiary fossils from Chiriqui, Central America.
 Rd before Phila. Acad. Nat. Sc. (1812), Dec. 18, 1860. In its Proc. v. 12, p. 567-68.

BUFFALO SOCIETY OF NATURAL SCIENCES (1861)

History

“The earliest effort in the city of Buffalo to organize a society for the study of natural history dates back to April 10, 1858, when eight or ten boyish enthusiasts agreed to meet every Thursday evening, for interchange of scientific observations . . . where they discussed the first chapter of Genesis, the value to science of Hugh Miller's labors or those of Dr Edward Hitchcock and other like grave subjects and out of their slender funds subscribed for the Scientific American and the Horticultural Magazine to aid their budding endeavors.

... At first they called themselves "The Buffalo Natural History Society" but that did not suit them and after changing their title to "The Buffalo Scientific Society" and trying its effect for a few months they finally decided to be known as "The Lyceum of Natural Science" a name which they retained during a year or two of their somewhat brief existence . . . Among those early devotees of science were Henry S. Sprague, Wm. M. Stewart, James H. Hall, and Edward C. Taintor, who a little later shared in the organization of the Buffalo Society of Natural Sciences.

... The thought seems to have slumbered until at the suggestion of Coleman T. Robinson six enterprising young men met on the evening of October 5, 1861, at the studio of Charles Caryl Coleman . . . to discuss the organization of a "Natural History Society." Those present constituted themselves a committee to further the project and when they met again a week later they reported 113 names for possible membership. Other preliminary sessions followed and Thursday evening, November 21, 1861, a larger meeting of those interested was held at Odd Fellows' Hall when a form of Constitution and suitable By-laws submitted by R. W. Haskins, David Gray and Coleman T. Robinson . . . were discussed, a primary election held and a call issued through the newspapers for a general meeting at Lower St. James' Hall on the evening of Thursday, December 5th.

At this meeting Judge Clinton presided. The "Constitution" was adopted, its first provision being that the Society should be called "The Buffalo Society of Natural Sciences" and its object "the promotion and study of the natural sciences, through the formation of a museum and a library, the procurement of lectures and by such other means as shall be efficient and desirable for that purpose." At this meeting Hon. George W. Clinton was made president; Rev. A. T. Chester and Charles Winne, vice-presidents; Samuel Slade, corresponding secretary; Theodore Howland, recording secretary; Leon F. Harvey, treasurer; and Richard K. Noye, librarian. The nine curators first chosen who, with the officers, made up the Executive Board for management of the Society's affairs were, George E. Hayes, William S. Van Duzee, Hiram E. Tallmadge, Charles T. Marshall, Coleman T. Robinson, Charles C. F. Gay, Charles S. Farnham, David F. Day and Charles F. Wadsworth.

. . . Within a year about one hundred names were added to the local membership, including Henry A. Richmond, Augustus R. Grote, William H. Glenny and many beside who have proven steadfast friends to the Society.

. . . The first lecturer was Prof. Benjamin Silliman who came for the evenings of Feb. 19th, 20th and 21st, 1862 . . . About April 1, 1862, other rooms were secured over the New York and Erie Bank on West Seneca Street near Pearl. Here the Museum was fairly started in cases provided by Coleman T. Robinson. Augustus R. Grote contributed 600 specimens of Coleoptera collected in the state of New York and a like number of a catalogued species of plants collected in the Rocky Mountains by Elihu Hall and J. P. Harlan.

W. W. Stewart was placed in charge of the Museum which grew so rapidly that soon the Seneca Street quarters were inadequate and more commodious rooms were taken in the third floor of the Jewett Building on Main St., opposite St. Paul's church, where the collections might be better displayed.

On the 23rd of January, 1863, the society was incorporated . . . April 17, 1863, the Executive Committee of the Young Men's Association adopted a resolution authorizing their building committee to confer with the other societies of Buffalo of a kindred character with reference to constructing a building which would accommodate the several organizations.

Accordingly in response to their invitation, on the 25th of April a Committee of the Society of Natural Sciences consisting of Judge Clinton, its president, David F. Day and Coleman T. Robinson were appointed for conference and July 9th, it was resolved "that this Society elects to Participate in the erection and occupancy of the proposed building for the use of the Young Men's Association, the Grosvenor Library and other institutions of the City, and to the raising of funds for that purpose." These negotiations finally ended in the purchase from Mr A. Brisbane of the property . . . at the corner of Main and Eagle Streets . . . for which the sum of \$112,000 was paid.

At this time subscriptions to the amount of \$81,655 were secured, the property purchased . . . and January 10, 1865, the new buildings were occupied and the Society of Natural History found itself housed under the same friendly roof with the library, Academy of Fine Arts and the Historical Society . . ."

HOWLAND, H. R.
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LINNAEAN SOCIETY OF LANCASTER, PA. (1862)

History

"... After many embarrassing delays and ineffectual attempts to organize this Committee upon a working basis—mainly arising from an apprehension that the pecuniary means necessary to give it practical effect, could not, or would not be furnished by the Society to which it was subordinate, the Committee on Natural Science at length conceived the idea of organizing a Natural History Society upon an independent footing, having for its object the cultivation and investigation of the natural history of Lancaster County and the vicinity; and for that purpose it met at the "Athanaeum rooms" on the 15th day of February, 1862, instituted and organized the Linnaean Society ...

The original members of the new Association that had been organized under the name of the Linnaean Society were men pursuing a variety of the active occupations of life, and not any of them possessed of either wealth or leisure. They consisted mainly of the old "Committee on Natural Science" of the Athanaeum and Historical Society, among whom were Prof. T. C. Porter, J. P. Wickersham, E. B. Weaver, and Messrs S. S. Rathvon, J. Stauffer, J. R. Sypher, J. B. Kevinski, Samuel Auxer, J. F. Heinitsch and D. G. Swartz. Subsequently Messrs G. M. Zahm, J. M. Seitz, H. M. Bruckert, J. S. Witmer, and others were added." Rathvon, p. 3-4.

The officers first elected were T. C. Porter, president and J. Stauffer, S. S. Rathvon, J. B. Kevinski and H. G. Bruckert, curators.

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WARD MUSEUM OF NATURAL HISTORY, ROCHESTER,
N. Y. (1862)*History*

The Ward Cabinets of Mineralogy and Geology, University of Rochester, Rochester, N. Y. were "collected by Mr Henry A. Ward, a native and citizen of Rochester. This gentleman had, as a student of Natural Science, visited our American localities quite extensively, and had obtained at them considerable collections of minerals and fossils.

"He afterwards spent six years in Europe, studying in the large museums, and travelling very widely through that continent and into Asia and Africa, in executing the detail of a plan which he had formed for a large mineralogical and geological museum.

"... Mr Ward says: 'I look upon the Cabinets as being for many reasons preeminently adapted for a large institution of learning. I have collected them, almost from the first, upon a plan which was strictly an educational one, and which contemplated a full and equal illustration of these sciences. I have wished that the student shall find in these collections a specimen representing each point of mineral composition, or structure, or form of extinct life, to which the study of his text-book, or his wider reading, shall have called his attention ...'

"These Cabinets were offered by Mr Ward to the University of Rochester (to which institution he had, in the meanwhile, been called as a professor of the Natural Sciences), for the sum of twenty thousand dollars—a sum which several men of science, experts in such questions, have declared to be far below their real value. A vigorous effort—inaugurated and led by President Anderson—resulted in the subscription of the entire sum by friends of the University, chiefly citizens of Rochester ...

"... Ten rooms in Anderson Hall, the largest of them, 58 by 33 feet—have been fitted up for the preservation and display of the specimens ... Unusual pains have been taken both for the surest preservation and the most perfect display of the specimens. Every specimen is mounted on a separate block, and is accompanied by a handsome label. Mr Ward proposes, when the work of Classification and labelling is complete, to prepare a full catalogue of the contents of the Cabinet. At present he has furnished a summary of the more prominent divisions, which will give an idea of their scope and richness.

“The two principal divisions are the Cabinets of Mineralogy and Geology . . .” See Notice of the Cabinets, 1863. p. 5–7. (See Bibliography, 1863, below.)

Notices of the Cabinets also appeared in the *Amer. J. Sc.*, v. 83 (ser. 2, v. 33), p. 449–51, Mar. 1862; v. 85 (ser. 2, v. 35), p. 152. Jan. 1863; & v. 92 (ser. 2, v. 42), p. 136, 1866.

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Gift of Ward's Natural Science Establishment to the University of Rochester.

NATIONAL ACADEMY OF SCIENCES, WASHINGTON, D. C. (1863)

History

“The National Academy of Sciences owes its origin as an organization, in an indirect manner, to the need of the government for technical scientific advice in connection with the conduct of the Civil War. In February, 1863, the Secretary of the Navy, Gideon Welles, appointed a ‘permanent Commission’ consisting of Joseph Henry, Secretary of the Smithsonian Institution, Alexander Dallas Bache, superintendent of the Coast Survey, and Charles M. Davis, chief of the Bureau of Navigation to report ‘on various matters of science and art,’ but chiefly of practical import and relating to the physical sciences. . . .”

The Academy was incorporated March 3, 1863, and was to consist of not more than fifty ordinary members.

The classes of the Academy were two in number: Class A) 1. Mathematics; 2) Physics; 3) Astronomy, geography, and geodesy; 4) Mechanics; 5) Chemistry; Class B) Natural history; 1) Mineralogy and geology; 2) Zoology; 3) Botany; 4) Anatomy and physiology; 5) Ethnology.

Of the first members of the Academy the following were naturalists: Louis Agassiz, S. F. Baird, J. D. Dana, George Engelmann, A. A. Gould, Asa Gray, James Hall, J. L. Le Conte, Joseph Leidy, J. P. Lesley, Leo Lesquereux, J. S. Newberry, W. B. Rogers, Benjamin Silliman, Sr., Benjamin Silliman, Jr., John Torrey, Jeffries Wyman, J. D. Whitney, Edward Hitchcock, J. G. Totten and J. P. Kirtland and Arnold Guyot.

In 1863, at its foundation, A. D. Bache was president; J. D. Dana, vice-president; Louis Agassiz, foreign secretary; Wolcott Gibbs, home secretary; Fairman Rogers, treasurer. The chairman and secretary of the Natural History Section were respectively Benjamin Silliman, Sr., and J. S. Newberry.

Prior to 1866 the only regular publication of the Academy was an Annual. See below, BIBLIOGRAPHY. A list of the PAPERS ON NATURAL HISTORY read before the Academy between 1863 and 1866 is given below, although the papers were not published because of the lack of a regular organ of publication. Only the titles are given to illustrate the type of material presented.

Bibliography

- 1864 NATIONAL ACADEMY OF SCIENCES. Report of the . . . for the year 1863. Washington, 1864. 118 p.
- 1865 ———. Annual of the . . . for 1863–1864. Washington, 1865. 112 p.
- 1877 ———. Proceedings of the . . . Washington, 1877. 1 v.
 ———. Biographical memoirs . . . Washington, 1877–date. v. 1–date.
 Contains biographical sketches of many of the leading naturalists of the 19th century. See for individual names, BIBLIOGRAPHY OF BIOGRAPHIES.
- 1891 BENJAMIN, Marcus. The National Academy of Sciences. (In *Chautauquan*. v. 12, no. 5, p. 601–5. Feb. 1891)
- 1913 NATIONAL ACADEMY OF SCIENCES. A history of the first half-century of the National Academy of Sciences: 1863–1913. Washington, 1913. 13 + 399 p. 4°.

ch. 1, p. 1- 23 Founding of the Academy

ch. 2, p. 25- 102 Annals of the Academy

ch. 3, Biographical sketches of the incorporators.

- 1914 HALE, George Ellery. . . . The first half-century of the National Academy of Sciences. (In *Science*. n. s. v. 39, p. 189-200. Feb. 6, 1914)

See also *Science*. n. s. v. 59, p. 405-10. May 9, 1924, for Addresses delivered on the occasion of the dedication of the Academy's new building in Washington.

Papers on Natural History

- 1864 AGASSIZ, Louis. On the individuality among animals with reference to the questions of varieties and species.
 ———. On the metamorphoses of fishes.
 ———. On the geographical distribution of fishes, as bearing upon their affinities and systematic classification.
- 1865 ———. On the homologies and classification of the Cephalopods.
 BAIRD, S. F. On the geographical distribution of North American birds.
 AGASSIZ, Louis. On the metamorphoses of some Malacopterygians.
 ———. On the glacial phenomena and present configuration of the state of Maine.
 WHITNEY, J. D. On the progress of the Geological Survey of California.
 ———. On the mineral lands of the United States, and the relations of the government to their management.
 NEWBERRY, J. S. On the origin and formation of sedimentary rocks.
 ———. On the origin and distribution of petroleum in the United States.
 LESQUEREUX, Leo. The Fucoids of the coal measures.
 WHITNEY, J. D. On the systems of mountain upheaval to which the continent of North America owes its present configuration.
 PUMPELLY, Raphael. Abstract of the geological investigations made in China and Mongolia.
 GOULD, A. A. Examination of shells obtained by the sounding-lead in the Coast Survey of New York and New Jersey . . .
- 1865 GUYOT, Arnold. On the probable immediate cause of the glacial epoch of the Post-Tertiary.
 NEWBERRY, J. S. On the lower Silurian oils of Kentucky and Tennessee.

HARVARD UNIVERSITY (GRAY) HERBARIUM,
CAMBRIDGE, MASS. (1864)

History

"... Dr Asa Gray has presented to Harvard University his invaluable Herbarium and his botanical library; which have been

safely transferred to the fire-proof building furnished, at a cost of over twelve thousand dollars, by the generosity of Nathaniel Thayer, Esq. of Boston. A fund has also been raised by subscription, for the support and increase of the collection. The gift of Dr Gray cannot be estimated in money, but it embraces the results of many years' labor faithfully given by that distinguished botanist, aided by the generosity of his collaborators and correspondents in various parts of the world. The collections were formally presented by the following letter:

Botanic Garden, Cambridge,
November 30, 1864.

To the Rev. Dr Hill,
President of Harvard University.

My Dear Sir: I have the pleasure to inform you that the Herbarium and Botanical Library, which a year ago I offered to present to the University, are now safely deposited in the building erected for their reception by Mr Thayer. I have regarded them as belonging to the University from the beginning of the present year: but I wish more formally to make them over to the President and Fellows, as the foundation of the Harvard University Herbarium.

The Herbarium is estimated to contain at least 200,000 specimens, and is constantly increasing. From the very large number of typical specimens it comprises, its safe preservation is very important.

The Library, from the rough catalogue which has been made out, contains about 2,200 botanical works—perhaps 1,600 volumes, and nearly as many separate memoirs, tracts, etc. . . .

The current expenses of the establishment for the first half of the year now drawing to a close have been defrayed by Dr Jacob Bigelow, who placed in my hands a special donation of two hundred dollars for this purpose.

I had stated that the income of a capital sum of 10,000 dollars would be required to defray the current expenses of the Herbarium i.e., for the purchase of certain collections and books not obtainable by exchange, for freights and charges, paper, alcohol, fuel, etc. I am informed that this sum which Mr George B. Emerson undertook to raise by subscription, is substantially secured. It is desirable, but probably not at this time practicable that the endowment should be so far extended as to provide for the services of a Curator, so that I could myself devote valuable time to the prosecution of important botanical works for which I am prepared, and to which I am pledged . . .

Asa Gray.

We understand that extensive collections of botanical specimens, to be added to the Herbarium, have recently accrued. Among them are:

A full suite of Mr Charles Wright's collections (about 2500 specimens) made in Cuba during the past four years, and just now arranged and distributed among botanists.

A very interesting set of plants recently collected, chiefly by Professor Brewer in the Geological Survey of California under Professor Whitney.

The numerous and important duplicate Carices (and other Cyperaceae), of the late Dr Boott, presented by Mrs Boott; the proper Herbarium set of Carices having been bequeathed to the Herbarium of the Royal Gardens of Kew.

A large collection of plants of Mauritius and Madagascar, and a continuation of the distribution of the British East Indian Herbaria of Griffith, Helfer, etc., presented by the directors of the Royal Botanic Gardens at Kew.

A similar distribution (in continuation) of plants of the Dutch East Indies and Japan, from the Royal Netherlands Herbarium, Leyden, now under the charge of Professor Miquel.

A selection from the Mexican collections of the late Professor Liebmann (oaks, ferns, Cyperaceae, etc.,) from the Royal Danish Botanic Gardens, Copenhagen.

An extensive set of authentically determined plants of Persia, Siberia, and northern China, from Professor Bunge of Dorpat; and of Algerian plants from Dr Cosson.

A set of Mandon's plants of the Andes of Bolivia, acquired by purchase. A fine general collection of Algae from Professor Agardh of Lund . . .

But the most notable accession is the munificent gift which has just been made by John A. Lowell, of all the botanical books of his own library which the new establishment did not already possess . . . in all 335 volumes, the pecuniary value of which must be reckoned at several thousand dollars. . . ." From AMER. J. SC. v. 89 [ser. 2, v. 39] p. 224-26. Mar. 1865.

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- 1886 ANON. The Gray Herbarium of Harvard University. (In Bot. Gaz. v. 11, p. 151-53. June, 1886)

KANSAS GEOLOGICAL SURVEYS (1864)

History

The state of Kansas authorized its first state geological survey very early in 1864. The Governor of the state appointed Benjamin Franklin Mudge as the first state geologist, for one year be-

ginning March 1, 1864. His assistants were Maj. Frederick Hawn, assistant geologist; Tiffin Sinks, chemist and meteorologist; George Clinton Swallow, palaeontologist, and C. A. Logan, botanist.

At the expiration of his term, Mudge was succeeded by Swallow. The other members of the Survey were reappointed. Both Reports were published in 1866.

Seven thousand five hundred dollars were appropriated for carrying on the survey.

For a brief account of the surveys of Kansas, see also HAYES, p. 59-60.

For a critical review of the geological aspects of the surveys, see MERRILL (1), p. 525-26; 527-28. See also MERRILL, G. P. First 100 yrs. Amer. Geol. 1924. p. 422-26.

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1887 HAY, Robert, and THOMPSON, A. H. Historical sketch of geological work in the state of Kansas. Topeka, 1887. (In Kansas Acad. Sc. Trans. for 1885-86. v. 10, p. 45-52)

1896 HAY, Robert. A bibliography of Kansas geology, with some annotations. Topeka, 1896. (In Kansas Acad. Sc. Trans. for 1893-94. v. 14, p. 261-78)

A classified list.

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1898 ADAMS, George I[rving]. The Upper Cretaceous of Kansas: a historical review. Topeka, 1898. (In Univ. Geol. Surv. Kansas. v. 4, Palaeontology. p. 13-27)

Addenda by S. W. WILLISTON, p. 28-32.

1908 HAWORTH, Erasmus, and BENNETT, John. History of field-work [in Kansas]. Topeka, 1908. (In Univ. Geol. Surv. Kansas. v. 9, ch. 2, p. 42-56)

1920 MERRILL, George P[erkins], ed. Kansas Geological Surveys. Washington, 1920. (In U. S. Nat. Mus. Bull. no. 109. p. 97-100. port.)

History of surveys to 1885.

Reports

1866 MUDGE, B[enjamin] F[ranklin]. First annual report on the geology of Kansas. Lawrence, Kansas, John Speer, 1866. 56+[1] p.

- A report for the year 1864. p. 4-15.
 Pt. 2, Economical geology. p. 17-53.
 Appendix. p. 55- 6.

SWALLOW, G[eorge] C[linton]. Preliminary report of the geological survey of Kansas. Lawrence, Kansas, John Speer, printer to the state, 1866. 198 p.

Report made Jan. 8, 1866.

CONTENTS:

- Introduction: What a geological survey should accomplish. p. [5]-8.
 Section of the rocks in Eastern Kansas. p. [9]-28.
 Geology of Kansas. p. [29]-48.
 Economical geology. p. [49]-69.
 Geological Report of Miami County. p. [71]-94.
 HAWN, Frederick. Report . . . of assistant geologist. p. 95-122. Dated Dec. 20, 1865.
 LOGAN, C. A. Report of the sanitary relations of the state of Kansas. p. 123-72. Dec. 1, 1865.
 Trees, shrubs, etc. of Kansas, p. 163-64.
 SINKS, Tiffin. Report of the climatology of Kansas. p. [173]-92.

LOUISIANA GEOLOGICAL SURVEY (1864)

History

Early in 1864, Gov. H. W. Allen of the state of Louisiana authorized Judge John B. Robertson of New Orleans "to begin a systematic investigation of the agricultural, mineral and manufacturing resources of the state." Robertson was accompanied by Charles Tripp, mineralogist; John H. Jones, and John Roy.

Sixteen months were spent in the field. In 1867, a Report was rendered to the state legislature. For a history of survey work in Louisiana to 1885, see MERRILL, under BIBLIOGRAPHY: 1920, below.

The New Orleans Academy of Sciences (1853), q.v., made active efforts at various times to bring about a survey of the state (see BIBLIOGRAPHY, below: 1858 & 1866).

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- 1858 NEW ORLEANS ACADEMY OF SCIENCES. Report of the special committee of the . . . appointed Dec. 7, 1857, to investigate and report, at as early a day as practicable, upon the subject of a geological and scientific survey of the state of Louisiana, with a view to bringing the matter before the Legislature of the State, at the

commencement of the ensuing session; unanimously adopted, Feb. 1, 1858. New Orleans, 1858. 13 p.

Committee consisted of Messrs. N. B. Benedict, J. L. Riddell, P. E. Bonford, A. G. Blanchard, and W. A. Gordon.

- 1866 ———. Memorial of the . . . to the Senate and House of Representatives of the State of Louisiana. New Orleans, 1866. 8 p.
- 1899 HARRIS, Gilbert D[ennison], and VEATCH, A[rthur] C[lifford]. Historical review of the geology of Louisiana . . . Baton Rouge, La., 1899. (In Louisiana Geol. Surv. Rept. for 1899. pt. 5, p. 11-44)
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 p. 23- 8, 2nd " : Reconnaissance period: 1867-1902.
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- 1920 MERRILL, George P[erkins], ed. Louisiana Geological Surveys. Washington, 1920. (In U. S. Nat. Mus. Bul. no. 109, p. 124-29).
 History of Surveys to 1885, chiefly from MS by E. W. HILGARD.

Report

- 1867 ROBERTSON, John B. Report . . . Jan. 1867. . . . New Orleans, 1867. 25 p.
 For discussion of Contents, see MERRILL (BIB.: 1920, above), p. 124-26.

AMERICAN JOURNAL OF CONCHOLOGY (1865)

History

The AMERICAN JOURNAL OF CONCHOLOGY was founded and edited by George Washington Tryon, Jr., and made its first appearance on Feb. 25, 1865. Seven volumes in all were published during its existence. It was published quarterly; irregularly however. The contents of the first volume for 1865 are given below. Volume 1 contains portraits of Thomas Say, A. A. Gould, C. B. Adams, and Isaac Lea; v. 2, those of Wesley Newcomb, J. G. Anthony, Thomas Bland, and S. S. Haldeman; v. 3, that of S. P. Kirtland.

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- 1865 AMERICAN JOURNAL OF CONCHOLOGY . . . edited by George W. Tryon, Jr. Phila., G. W. Tryon, Jr., 1865-71. 7 v.
 v. 1, 8+387 p. 27 pl. port.
- 1901 SYKES, E[rnest] R[uthven]. Digesta malacologia; no. 1: A summary of the American Journal of Conchology, 1865-1872. London, 1901. 8+46 p.

CONTENTS.

v. 1, pt. 1, Feb. 25, 8 + p. 1-96, port.

- 1865 CONRAD, T. A. Catalogue of the Eocene and Oligocene Testacea of the United States. p. 1-35.

Corrections & additions opp. p. 190, in no. 2, (2p.)

ANTHONY, J. G. Descriptions of two new species of *Goniobasis*. p. 36, illus.

G. translucens; *G. interlineata*, A.

HALDEMAN, S. S. Description of two new species of *Goniobasis*. p. 37, illus.

G. graminea; *G. catabea*; Haldeman.

TRYON, G. W., Jr. Description of new species of *Strepomatidae*. p. 38, illus.

Goniobasis Haldemani, T.; *Pleurocera Conradi*, T.

———. Descriptions of new species of *Pholadidae*. p. 39-40, illus.

Navea Newcombi, T., *Penitella parva*, T., *P. curvata*, T.

———. Observations on the genus *Io*. p. 41-4, 2 pl.

BLAND, Thomas. Note on the buccal plate (jaw), in certain genera of the family *Cyclostomacea*. p. 45-6, 1 pl.

BINNEY, W. G. Note on the jaws of *Helices*. p. 47, 1 pl.

———. Description of the genus *Ariolimax*, Morch. p. 48.

———. Descriptions of new species of North American land and fresh water shells. p. 49-51, 1 pl.

STIMPSON, William. Diagnoses of newly discovered genera of *Gastropods*, belonging to the family (sub) *Hydrobiinae*, of the family *Rissoidae*. p. 52-4, 2 pl.

———. On certain genera and families of zoophagous *Gastropods*. p. 55-64, illus.

WHEATLEY, C. M. Revision of M. Petit's Catalogue of the genus *Monoccondyloea*, D'Orb. p. 65-6.

TRYON, G. W., Jr. Catalogue of *Mollusca* collected by Prof. D. S. Sheldon, at Davenport, Iowa. p. 68-70.

v. 1, pt. 2, p. 97-190, pl. port., April 15

———. Observations on the family *Strepomatidae*. p. 97-135, 1 pl.

BROWN, A. D. Descriptions of two new species of *Helix*. (*H. Liberiae*, nob. & *H. Africae*, nob.). p. 136.

CONRAD, T. A. Description of new Eocene shells from *Enterprise*, Missouri. p. 137-41, 1 pl.

———. Description of new Eocene shells of the United States. p. 142-49, 1 pl.

———. Catalogue of the older Eocene shells of Oregon. p. 150-54, 5 pl.

ANTHONY, J. G. Descriptions of new species of North American Unionidae. p. 155-64.

TRYON, G. W., Jr. Catalogue of the species of Physa, inhabiting the United States. p. 165-73.

v. 1, pt. 3, p. 191-286, port. pl. July 1.

ANTHONY, J. G. Descriptions of two new species of Monocondyloea (*M. Peguensis* & *M. crebristriata*, A.). p. 205-6, illus.

———. Description of a new exotic *Melania* (*gloriosa*). p. 207, illus.

GABB, W. M. Description of three new species of Mexican land shells. p. 208-9, illus.

Cylindrella Remondii; *Helix* (*Polygyra*) *Behrii*; & H. (P.) *Anilis*
CONRAD, T. A. Description of new Eocene shells, and references with figures to published species. p. 210-12, pl.

———. Description of five new species of older Eocene shells from Shark River, Monmouth Co., N. J. p. 213-15, pl.

TRYON, G. W., Jr. Descriptions of new species of *Melania*. p. 216-18, illus.

———. Descriptions of new species of *Amnicola pomatiopsis*, *Somatogyrus Gabbia*, *Hydrobia* and *Rissoa*. p. 219-22, illus.

———. Descriptions of new species of North American *Limnaeidae*. p. 223-31, illus.

CONRAD, T. A. Remarks on the genera *Monocondyloea*, *D'Orb.*, and *Pseudodon*, Gould, with a synopsis of the latter. p. 232-33.

———. Description of a new genus of Unionidae (*Arconaia lanceolata*). p. 234.

NEWCOMB, Wesley. Description of a new species of *Helix* (*macrocyclus*, *Voyana*). p. 235, illus.

TRYON, G. W., Jr. Review of the *Goniobases* of Oregon and California. p. 236-46, 1 pl.

———. Catalogue of the species of *Limnaea* inhabiting the United States. p. 247-58.

WHITFIELD, R. P. Descriptions of new species of Eocene fossils. p. 259-68, 1 pl.

v. 1, pt. 4, p. 287-387, pl. port. October 1.

PEASE, W. H. Descriptions of new species of *Phanero-pneumona*, inhabiting Polynesia. p. 287-91.

CURRIER, A. O. Catalogue of the Mollusca of Grand Rapids, Michigan. p. 292-96.

Assisted by J. A. McNIEL & William H. De Camp.

TRYON, G. W., Jr. Description of a new species of *Mercenaria*. p. 297.

HALDEMAN, S. S. On the propriety of *Leptoxis* as a generic name. p. 298, 378.

TRYON, G. W., Jr. Monograph of the family *Strepomatidae*. p. 299-341. [257 fig.]

NEWCOMB, Wesley. Catalogue of *Helices* inhabiting the west coast of America, north of Cape St. Lucas, and west of the Rocky Mountains; together with remarks upon some of the animals, and their special distribution. p. 342-50.

Additions in v. 2, p. 13. Jan. 1866.

ANTHONY, J. G. Description of new species of shells (*Unio Peguensis* & *Helix Cerinoidea*). p. 351.

CONRAD, T. A. Description of a new species of *Pseudodon* (*ellipticum* Conrad). p. 352.

NEVADA GEOLOGICAL SURVEY (1865)

History

By virtue of an act approved March 20, 1865, the state legislature of Nevada authorized the appointment of a state geologist, and the expenditure of \$6,000 for the maintenance of a state geological survey. Nothing seems to have been done until 1866, when under a new act R. H. Stretch was appointed state geologist.

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BIBLIOGRAPHY OF BOOKS, PAMPHLETS, AND MISCELLANEOUS ARTICLES ON AMERICAN NATURAL HISTORY:

1590-1865

A. Colonial Period: 1590-1768

B. Pioneer Century: 1769-1865

PART A: Colonial Period: 1590-1768

Many of the papers which appeared in the Philosophical Transactions of the Royal Society of London were also published in abstract in the 1749 (5th ed. corrected) and 1809 editions of the early Transactions. Pagination for these editions is therefore added after each entry.

- 1590 HARIOT, Thomas [or Harriot, or Harriott]. A briefe and true report | of the new found-land of Virginia, | of the commodities and of the nature and man | ners of the naturall inhabitants, Discouered

by the English colony there seated by Sir Richard Greinuile Knight In the yeere 1585. Which rema ined vnder the gouvernement of twelve monethes At the special charge and direction of the Honou rable Sir Walter Raleigh Knight, Lord Warden of the stanneries Who therein hath been favoured and authorised by her Maestie and her letters patent: This fore booke Is made in English By Thomas Harriot servantt to the aboue named Sir Walter, a member of the Colony, and there imployed in discovering Cum Gratia et Privilegio, Caes Matis Specialis . . . Francoforti ad Moenum Typis Ioannis Wecheli sumtibus vero Theodori De Bry Anno COIIIXC [1590]. 33 p. 4°.

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Repr. & ed. by W. Harry Rylands. Manchester, England, 1888. [4], 33, [46] p. 24 pl. (Holbein Soc.)

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- 1607 NEWPORT, Christopher. A relation of the discovery of our river, from James Fort, made into the Maine, made by . . . and sincerely written and observed by the gentleman of the colony, 1607. (In Amer. Antiquarian Soc. Archaeologia Americana. Worcester, Mass., 1860. v. 4, p. 40-65)

- 1609 DE SOTO, Ferdinando. Virginia, richly valued, by the description of the maine land of Florida . . . Lond. 1609. 77 p.

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- 1612 SMITH, John. A map of Virginia with a description of the country, the commodities, people, government, and relegeon . . . Oxford, printed by Joseph Barnes, 1612. 174 p.
See also Goode, G. B., in U. S. Nat. Mus. Ann. Rept. for 1897. p. 371-72. 1901 & Biol. Soc. Wash. Proc. v. 3, p. 55-6. 1886.
See also COUES (1), pt. 1, p. 569. See also SABIN, v. 20.
- 1615 HAMOR, Ralphe. True discourse of the present state of Virginia. Lond. Printed by John Beale for W. Welby, 1615. 4 + 69 + [1] p.
Repr. Albany, Munsell, 1860. 5 + 69 p.
See also COUES (1), pt. 1, p. 569. See also SABIN, v. 8, p. 46-7.
- 1620 * LINOCIER, Geoffroy. Histoire des plantes nouvellement trouvees en l'isle de Virginie et autres lieux, lesquelles ont ete prises et cultivees au jardin dudit Robin. Paris, 1620. (In Dupinet, Antoine. L'histoire des plantes, traduit du Latin . . . par Geoffroy Linocier. Paris, 1622)
- 1624 SMITH, John. The generall historie of Virginia, New-England and the Summer Isles . . . Lond. 1624. 12 + 248 p. 5 pl. 2 fold. maps.
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- 1630 [HIGGINSON, Francis] New-England's plantation; or, a short and true description of the commodities and discommodities of that country written by a reverend Divine now there resident . . . Lond. Michael Sparlee, 1630. 20 p. 4°.
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- 1632 MORTON, Thomas. New English Canaan; or, New Canaan, containing an abstract of New England, composed in three books . . . 1632.
See also Goode, G. B. U. S. Nat. Mus. Ann. Rept. 1897. Wash. 1901. p. 373-74.
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- 1633 WHITE, Andrew. An account of the colony of the Lord Baron of Baltimore. 1633.
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- 1649 ANON. *A perfect description of Virginia*. Lond. 1649. 18 p.
Natural history, p. 16-8.
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- 1655 *DONCK, Adriaen van der. *Beschryvinge Van Nieuw-Nederlant*
. . . Amsterdam, 1655. [6] + 100 + [3] p. 1 illus.
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v. 5, p. 482-83.
- 1656 *TRADESCANT, John. *Museum Tradescantianum: or, A collec-*
tion of rarities preserved at South-Lambeth near London. London,
printed by John Grismond, and are to be sold by Nathanael Brooke
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- 1738 DALE, Samuel. A letter . . . to Sir Hans Sloane . . . containing descriptions of the mosse-deer of New England, and a sort of stag in Virginia, with some remarks relating to Mr. Ray's Description of the flying squirrel of America. (In Philos. Trans. v. 39, p. 384-89. 1738)

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DUDLEY, Paul. An account of the several earthquakes which have happened in New England since the first settlement of the English in that country, especially of the last, which happened in October 29, 1727. (In Philos. Trans. v. 39, p. 63-73. 1738)

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LOGAN, James. Some experiments concerning the impregnation of the seeds of plants . . . in a letter to Peter Collinson. (In Philos. Trans. v. 39, (1735-36), p. 192-95. 1738)

Abstracts in Abridg. ed., v. 8, p. 804-6, 1747; & ed. 1809, v. 8, p. 57-8.

Written Nov. 20, 1735.

Repr. in *Physicalische Belustigungen* ed. by Von Mylius, Berlin, 1757. v. 3, p. 1088-1102.

- 1739 *GRONOVIVS, J. F., and CLAYTON, John. *Flora Virginica; exhibens plantae quas V. C. Johannes Clayton in Virginia observavit atque collegit, easdem methodo sexuali disposuit ad genera propria retulit, nominibus specificis insignivit et minus cognitae descripsit J. F. Gronovius. Lugduni Batavorum, [1739]-43. 2 pts. in 1 v. [4]+206+[16] p. 4°.*

Another ed. *Flora Virginica . . . quas nobilissimus vir Johannes Claytoniis in Virginia crescentes observavit, collegit et obtulit Joh. Fred. Gronovio cujus studio et opera descriptae et in ordinem sexualem systematicum redactae sunt. Lugduni Batavorum, 1762. [10]+176+[8] p. map. 4°.*

See Britten, James. *Flora Virginica*. (In Jour. Bot. v. 36, p. 264-67. 1898)

LOGAN, James. *Experimenta et meletemata de plantarum generatione nec non canonum pro inveniendis refractionum, tum simplicium, tum in lentibus, duplicium focus demonstrationes geometricae. Lugduni Batavorum, 1739. 32 p. 3 pl.*

English transl. by John Fothergill. Lond. C. Davis, 1747. viii, 39 p. Latin & English on opposite pages.

- 1741 ANON. A description of Georgia by a gentleman who has resided there upwards of seven years and was one of the first settlers. Lond. 1741. 6 p.
Repr. in (FORCE, Peter. Historical tracts. 1838. v. 2, no. 12)
- 1742 MITCHELL, Jo[hⁿ]. Dissertatio brevis de principis botanicorum et zoologorum, deque novo stabiliendo naturae rerum congruo, cum Appendice aliquot generum plantarum recens conditorum et in Virginia observatorum. (In Acta Acad. Nat. Curios. v. 8, appx. p. 187-224. 1742)
Repr. Norimbergae, Wolfgangi Schwarzkopfi, 1769. 46 p.
- 1744 BARTRAM, John. . . . Concerning a cluster of small teeth observed by him at the root of each fang or great tooth in the head of a rattlesnake, upon dissecting it. (In Philos. Trans. v. 41, p. 358-59. 1744)
Written July 17, 1734. Abstracts in Abridg. ed. 1747, v. 9, p. 60; & ed. 1809, v. 8, p. 409.
- *CHARLEVOIX, P. F. X. de. Histoire et description generale de la Nouvelle France, avec le Journal historique d'un voyage fait par ordre du roi dans L'Amerique Septentrionale . . . Paris, Chez Rollin fils, 1744. 6 v. 44 pl. 26 maps, 2 plans, front.
English ed. Lond., R. & J. Dodsley, 1761. 2 v. illus. map. Transl. of v. 3 only.
Description of plants, v. 2, p. 1-56, 22 pl.; v. 4, p. 299-377, 44 pl. Birds in v. 3.
Transl. with notes by John G. Shea. N. Y. Shea, 1866-72. 6 v. illus. pl. port. plans, facsim.
Another ed., with a memoir of Shea, by Noah F. Morrison. N. Y. F. P. Harper, 1900. 6 v.
See also COUES, (1), pt. 1, 578, 582, and SABIN, v. 3, p. 520-22.
- CLAYTON, John. A letter . . . to Dr. Grew in answer to several queries relating to Virginia, sent to him by that gentleman, A. D. 1687. (In Philos. Trans. v. 41, p. 143-62. 1744)
Abstracts also in Abridg. ed. 1747. v. 9, p. 465-75; & ed. 1809, v. 8, p. 328-335. (303!)
- MOORE, Francis. A voyage to Georgia begun in the year 1735, containing an account of the settling of the town of Frederica in the southern part of the province and a description of the soil, air, birds, beasts, trees, rivers, islands . . . Lond. Jacob Robinson, 1744. [2], 108, [2] p.
See also SABIN, v. 12, p. 336.
- 1746 BARTRAM, John. . . . Containing some observations concerning the salt-marsh muscle, the oyster-banks, and the freshwater muscle of Pennsylvania. (In Philos. Trans. v. 43, p. 157-59. 1746)

Rd before Society, Nov. 8, 1744. Abstract in Abridg. ed. 1809. v. 9, p. 70-1. & 1756 ed. v. 10, p. 860-61.

———. On some very curious wasps' nests made of clay in Pensilvania. (In Philos. Trans. v. 43, p. 363-66, illus. 1746)

Rd April 25, 1745. Abstracts also in Abridg. ed. 1756. v. 10, p. 847-48, illus.; & ed. 1809. v. 9, p. 123-24

- 1749 COLDEN, Cadwallader. *Plantae Coldenhamiae in provincia Noveboracensi Americae sponte crescentes, quas ad methodum Linnaei sexualem, anno 1742 etc., observavit et descripsit.* (In Societatis regiae scientiarum Upsaliensis. Acta. 1749-51. v. 4, p. 81-136; & v. 5, p. 47-82)

KALM, Pehr. [Papers on natural history . . .] (In Kongl. Vetenskaps Academiens. Handlingar. v. 10-39. Stockholm, 1749-1778) (Titles and text in Swedish).

This list was prepared by Mr. Kenneth K. Mackenzie of Maplewood, N. J. The English titles which have been given below were translated by Mr. Mackenzie and Mr. Jules Dieserud of the Library of Congress.

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| v. 10, p. 70-5 | 1749 | On N. A. trees and grasses. |
| 11, p. 280-90 | 1750 | Lobelia as a sure remedy against venereal diseases. |
| 12, p. 143-59 | 1751 | Sugar yielding plants of N. A. |
| p. 190-96 | | Spruce-beer. |
| p. 305-18 | | Description of maize. |
| 13, p. 24-43 | 1752 | " " |
| p. 145-55 | | Aurora borealis. |
| p. 308-19 | | N. A. rattlesnake and remedies. |
| 14, p. 52-67 | 1753 | " " " (cont.) |
| p. 185-94 | | " " " (concl.) |
| 15, p. 19-31 | 1754 | Flying insects (ticks). |
| 17, p. 101-16 | 1756 | Grasshoppers. |
| 20, | 1759 | Passenger pigeon. |
| | | transl. in Anh. v. 28, Jan. 1911. & Smith. Inst. Ann. Rept. for 1911. Wash. 1912. p. 407-17. |
| 22, p. 19-41 | 1761 | Effect of temperature on plants. |
| 129-43 | | " " " |
| 25, p. 124-39 | 1764 | Fruit parasites. |
| 28, p. 51-64 | 1767 | Black walnut. |
| 30, p. 119-27 | 1769 | White walnut. |
| 32, p. 52-9 | 1771 | Temperature on ocean & inland waters. |
| 34, p. 343-49 | 1773 | Hawthorns. |
| 37, p. 143-63 | 1776 | Mulberry tree (<i>Morus rubra</i>). |
| 39, p. 262-83 | 1778 | Hickories. |

- 1750 BARTRAM, John. A description of the great black wasp, from Pennsylvania. (In *Philos. Trans.* v. 46, p. 278-79. 1750)
 Rd before Society, Dec. 21, 1749. Abstract in *Abridg. ed.* 1809. v. 9, p. 699 & 1756 ed. v. 10, p. 848-49.
- . 1) Some observations on the dragon fly . . . 2) A further account of the Libellae, or May-flies . . . (In *Philos. Trans.* v. 46, p. 323-25; p. 400-2. 1750)
 Rd Feb. 1 & April 5, 1750. Abstracts in *Abridg. ed.* 1809. v. 10, p. 4-5, 28. & ed. 1756. v. 10, p. 845-47.
- 1751 BARTRAM, John. Observations on the inhabitants, climate, soil, rivers, productions, animals, and other matters worthy of notice, made by . . . in his travels from Pensilvania to Onondago, Oswego, and the Lake Ontario, in Canada; to which is annex'd, a curious account of the cataracts of Niagara, by Mr. Peter KALM . . . Lond. Printed for J. Whiston & B. White, 1751. 94 p. front. (map).
 KALM'S Letter, p. 79-94.
 See also *Jour. Botany.* v. 44, p. 213-14. 1906. By James Britten.
- *SHORT, T[homas], and BARTRAM, John. *Medica Britannica*; or, Treasure of such physical plants as are generally to be found in the fields or gardens of Great Britain . . . to which is added an appendix, containing the true preparation, preservation, uses, doses of most forms of remedies necessary for private families; by T. Short; with a preface by Mr. John Bartram, and his notes throughout the work, showing the places where many of the described plants are to be found in these parts of America, their differences in name, appearance and virtue from those of the same kind in Europe, and an appendix containing a description of a number of plants peculiar to America, their uses, virtues, etc.; 3d ed. Phila. Printed and sold by B. Franklin, 1751. 20 + 339 + 40 + [7] p.
 Preface, p. 17-20 & last appendix, 7 p., are by John BARTRAM.
 First ed. by SHORT, Lond. 1746. 32 + 352 p.
- *KALM, Pehr. *En kårt berättelse om naturliga, Stället, nytton, samt skötseln af några växter ntaf hwilka frön nyligen blifwit hembragte från Norra America til deras tjenst som hatwa nöje, at it vårt klimat gora försök de sammans cultiverande.* Stockholm, 1751. 48 p. no title-page (colophon).
- 1753 HARRISON, John. Two letters . . . to Peter Collinson, concerning a small species of wasps. (In *Philos. Trans.* v. 47, p. 184-87. 1753)
 Rd May 9, 1751. Written July 29 & Dec. 22, 1748, from Cambridge, Mass. Abstract in *Abridg. ed.* 1809. v. 10, p. 182-84.

*KALM, Pehr. En rêsa til Norra America, på Kongl. Swenska Wetenskaps Academiens befallning, och publici kostnad, forrottad af Pehr Kalm . . . Stockholm, Tryckt på L. Salvii kostnad, 1753-61. 3 v. illus. pl.

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v. 2, 1756, 526 + [22] p.

v. 3, 1761, 538 + [14] p.

German ed., & transl. by J. A. & J. F. Murray. Gottingen, 1754-64. 3 v. 8 pl.

English ed., transl. by J. R. Forster. Lond. 1770-71. 3 v. (2d ed. 1772). Entitled: "Travels into North America; containing its natural history and a circumstantial account of its plantations and agriculture in general . . ."

Dutch ed., Utrecht, 1772. 2 v. Repr. (in Pinkerton, J. A. A general collection of voyages . . . 1812. v. 13, p. 374-700, pl) Repr. from 2d Lond. ed.

Canadian ed., transl. by L. W. Marchand. Montreal, Berthiaume, 1880. 2 v. (In Soc. Historique de Montreal. Mem. v. 7-8)

See also: Strohm, A. J. English translation of Dedication and Preface of Peter Kalm's Travels. (In Pennsylvania Mag. Hist. & Biog. v. 36, p. 17-29. 1912)

See also Essex Inst. Bull. v. 20, p. 90-100. 1888. (Fishes in K., by Samuel Garman.)

See also Pop. Sc. Mthly. v. 71, p. 413-19, 1907. (Spencer Trotter.)

See also v. 1, p. 200, KALM.

See also COUES (1), pt. 1, p. 580-81, 583, 584-85 & SABIN, v. 9, p. 382-83.

1755 EVANS, Lewis. Geographical, historical, political and mechanical essays . . . Phila. Franklin & Hall, 1755. iv, 32 p.

Map $27\frac{1}{2} \times 20\frac{1}{2}$ in.

See SABIN, v. 6, p. 272.

1756 COLDEN, Jane. The description of a new plant, by Alexander GARDEN; essays and observations, physical and literary. (In Philos. Soc. Edinburgh. v. 2, p. 1-7. 1756)

1757 *VENEGAS, Miguel. Noticia de la California . . . Madrid, 1757. 3 v. 4 maps. 4°.

English transl.: A natural and civil history of California, containing an accurate description of that country, its soil, mountains, harbours, lakes, rivers and seas, its animals, vegetables, minerals, and famous fishery for pearls; the customs of the inhabitants. . . . Lond. Rivington & Fletcher, 1759. 2 v. illus. pl. map.

Vegetable products, v. 1, p. 41-6.

French transl. Paris, 1767. 3 v. map.

1758 *LE PAGE DU PRATZ. Histoire de la Louisiane, contenant la découverte de ce vaste pays; sa description géographique; un voy-

age dans les terres; l'histoire naturelle . . . Paris, De Bure, l'aîné, 1758. 3 v. pl. maps, fold. plan. [42 pl. in all].

v. 1, xvi, 358 p. maps & pl.

v. 2, [4], 441 p. pl.

v. 3, [4], 451 + [5] p. pl.

Botany, v. 2, p. 15-65.

Ornithology, v. 2, p. 109-43.

English transl. Lond. 1763. 2 v. v. 1, 2 p. ll., i-viii, i-l, 1-368, map. v. 2, 4 p. ll, 1-272 p. map.

Another ed. Lond. 1774. [8] + 36 + 387 p. 2 maps.

Another ed. Newbern, [N. C.] Franklin & Garrow, 1804. [4], 272, cxviii, [2] p.

See also COUES (1), pt. 1, p. 581-82, 585, & SABIN, v. 10, p. 223-24.

WINTHROP, John. An account of the earthquake felt in New England and the neighboring parts of America, Nov. 18, 1755. (In Philos. Trans. v. 50, p. 1-18. 1758)

Rd Jan. 13, 1757. Abstract in Abridg. ed. 1809. v. 11, p. 62-6.

- 1759 *ACRELIUS, Israel. Beskrifning om de swenska fersamlingars forma och nerwarande tilstand, utidet sa kallade Nya Sverige, sedan Nya Nederland, men nu for tiden Pensylvanien, samt nastliggande orter wid alfwen (!) De la Ware, Wast-Yersey, och New-Castle county uti Norra America. Stockholm, Harberg & Hesselberg, 1759. 10 p., 1,533, [1] p .

Paging irregular, no. 171, 174, 448, 450-78 omitted; no. 193-94 duplicated. Library of Congress cards.

Transl. in part by Nicholas COLLIN. (In N. Y. Hist. Soc. Coll. 2d ser. v. 1, p. [401]-48. 1841)

Transl. by W. M. Reynolds. (In Hist. Soc. Pa. Mem. v. 11, L, 17-468 p. 1874)

See also SABIN, v. 1, p. 20.

- 1760 *ELLIS, John. An account of the plants Halesia and Gardenia, in a letter from . . . to Philip Carteret Webb. (In Philos. Trans. v. 51, p. 929-35, pl. 1760)

Alexander GARDEN's Account of the flower, p. 930-31. Abstract in Abridg. ed. 1809. v. 11, p. 508-9

HUTCHINS, Thomas. Western Pennsylvania in 1760; a journal of a march from Fort Pitt to Venango, and from thence to Presqu' Isle. (In Pa. Mag. Hist. & Biog. v. 2, p. 149-53. 1878)

- 1762 *ELLIS, John. An account of the male and female cochineal insects that breed on the cactus opuntia, or Indian fig, in South Carolina and Georgia . . . in a letter to Peter Wych. (In Philos. Trans. v. 52, p. 661-67, illus. 1762)

Sent by Alexander GARDEN. Abstract also in Abridg. ed. 1809. v. 11, p. 674-76.

- 1763 *CATESBY, Mark. *Hortus Britanno-Americanus; or, A curious collection of trees and shrubs, the produce of the British colonies in North America; adapted to the soil and climate of England, with observations on their constitution, growth and culture . . .* Lond. John Ryall, 1763. [6] + 41 p. 17 pl. folio.

Another ed. Lond. 1767, entitled:

“*Hortus Europae-Americanus; or, A collection of 85 curious trees and shrubs, the produce of North America, adapted to the climates and soils of Great Britain, Ireland and most parts of Europe . . . together with their blossoms, fruits and seeds, observations on their culture, growth, constitution and virtues. . .*”

Lond. J. Millan, [2] + 6 + 41 p. 17 pl. (63 fig.) 4°. 1767.

See also SABIN, v. 3, p. 432.

*KALM, Pehr. *Norra Amerikaniska färge-örter . . . under . . .* Abo, E. Hollberg, [1763]. 8 p.

A dissertation.

- 1764 BARTRAM, John. *Observations made . . . at Pensilvania, on the yellowish wasp of that country . . .* (In *Philos. Trans.* v. 53, p. 37-8. 1764)

Rd Feb. 24, 1763 Abstract in Abridg. ed. 1809. v. 11, p. 685-86.

———. [Seven autograph letters to John Fothergill. 1764-71]. In the Library of the British Mus. Nat. Hist.

*ELLIS, John. *An account of the sea pen or Pennatula phosphorens of Linnaeus, likewise a description of a new species of sea pen on the coast of South Carolina, with observations on sea pens in general.* (In *Philos. Trans.* v. 53, p. 419-35, 3 pl. 1764)

Rd. Dec. 22, 1763. Abstract in Abridg. ed. 1809. v. 12, p. 41-4.

- 1765 *COLLINSON, Peter. *Some observations on the Cicada or locust of North America.* (In *Philos. Trans.* v. 54, p. 65-8, 1 pl. 1765)

Rd Feb. 23, 1764. Abstract in Abridg. ed. 1809. v. 12, p. 100-2.

SMITH, Samuel. *The history of the colony of Nova-Caesaria or New-Jersey . . . to the year 1721 . . .* Burlington, N. J., 1765. 10 + 573 p.

2d ed. Burlington, [c1877], 14 + 602 p. 2 maps.

- 1767 [*STORK, William and BARTRAM, John.] *An account of East-Florida, with a journal, kept by John Bartram, upon a journey from St. Augustine up the river St. John's, by William Stork.* Lond. [1767]. [4] + 90 + 8 + 70 p.

3d ed. Lond. 1769. 8 + 40 + 12 + 35 p. 3 maps. 4°.

- 1768 *BOSSU, J. B. *Nouveaux voyages aux Indes Occidentales; contenant une relation des differens peuples qui habitent les environs du grand fleuve Saint-Louis, appelé vulgairement le Mississippi; leur religion; leur gouvernement; leurs moeurs; leurs guerres & leur commerce . . .* Paris, Le Jay, 1768. 2 v. in 1. 2 pl. front. Bossu's observations on his visits to the U. S., 1751-57 & 1757-62. 2d ed. Paris, 1768. 2 v. 3 pl. front. Tr. by J. R. FORSTER, Lond. 1771, 2v. (q.v. below.)
See also SABIN, v. 2, p. 300-2.
Dutch ed. Amsterdam, S. VAN ESVELDT, 1769. 2 v. in 1. 3 pl. front.
See also COUES, (1). Pl. 1, p. 583.
- *COLLINSON, Peter. 1) An account of some very large fossil teeth found in North America; 2) A sequel to the foregoing account of the large fossil teeth. (In *Philos. Trans.* v. 57, p. 464-69, 2 pl. 1768)
Rd Nov. 26 & Dec. 10, 1767. Abstract in *Abrig. ed.* 1809. v. 12, p. 476-78. Teeth and bones sent by George Croghan.
- *KALM, Peter [Pehr]. *Histoire naturelle et politique de la Pensylvanie traduit de l'allemand [par de Surgy]*. Paris, 1768. 20+372 p. map.
Regne végétal. p. 46-86.

PART B. Pioneer Century: 1769-1865

Nine point type indicates Books.

Eight point type indicates periodical articles or pamphlets.

- 1769 HUNTER, William. *Observations on the bones, commonly supposed to be elephant bones, which have been found near the river Ohio in America.* (In *Philos. Trans.* v. 58, p. 34-45, 1 pl. 1769.)
Rd Feb. 25, 1768.
Abstract also in *Abridg. ed.* 1809. v. 12, p. 504-7.
- 1771 *ELLIS, John. *The figures and character of that elegant American evergreen, called by the gardeners Loblolly Bay, taken from blossoms blown near London.* (In *Philos. Trans.* v. 60, p. 518-23, 1 pl. 1771.)
Also in *Abridg. ed.* *Trans.* 1809. v. 13, p. 84-5.
———. . . . An account of a new species of *Illicium Floridanum*, Linnaei, or starry anniseed tree, lately discovered in West Florida. (In *Royal Soc. London. Philos. Trans.* v. 60, p. 524-31, 1 pl. 1771)
Also in *Abridg. ed.* *Trans.* 1809. v. 13, p. 85-8.
- *FORSTER, J. R. *A catalogue of the known plants, shrubs and trees in North America, collected from various writers on that subject.* (In BOSSU, J. B. *Travels through that part of North America formerly called Louisiana.* Lond. 1771. v. 2, p. 17-67.)
Also issued separately. Lond. 1771. 8+51 p.
See 1768: Bossu (above).

———. A catalogue of the animals of North America . . . to which are added short directions for collecting, preserving and transporting all kinds of natural history curiosities . . . Lond., B. White 1771. 43 p. 1 pl. (front.)

Repr. with preface by P. L. Selater, 1882, in the Publications of the Willughby Society.

See also COUES (1), pt. 1, p. 584.

*PENNANT, Thomas. An account of two new tortoises, in a letter to Matthew Maty, May 2, 1771. . . . (In *Philos. Trans.* v. 61, p. 266-73, 1 pl. 1771.)

1773 *ELLIS, John. Some additional observations on the method of preserving seeds from foreign parts, for the benefit of our American colonies; with an account of the garden at St. Vincent, under the care of George Young. Lond. 1773. 15 p. 4°.

1775 GARDEN, Alexander. An account of the electrical eel, *Gymnotus electricus*. (In *Philos. Trans.* v. 65, p. 102-10. 1775.)

Written, Charleston, S. C., Aug. 14, 1774.

Abstract in *Abridg. ed.* 1809. v. 13, p. 600-4.

[MITCHELL, John]. American husbandry, containing an account of the soil, climate, production and agriculture of the British colonies in North America and the West-Indies; with observations on the advantages and disadvantages of settling in them, compared with Great Britain and Ireland, by an American . . . London, printed for J. Bew, 1775. 2 v.

v. 1, 472 p.; v. 2, 319 + 16 p.

See Lyman Carrier. *Amer. Hist. Assoc. Ann. Rept.* for 1918. p. 199-219. & *Amer. Soc. Agron. Jour.* v. 11, no. 5, p. 206-11. 1919.

ROMANS, Bernard. A concise natural history of East and West Florida; containing an account of natural produce of all the southern part of British America, in the three kingdoms of nature, particularly the animal and vegetable; likewise, the artificial produce now raised and manufactured there, with some commercial and political observations in that part of the world, and a choro graphical account of the same . . . N. Y. Printed for the author, 1775. 4 + 342 p. 6 pl. 3 maps. fold. tab.

Extended notes in SABIN, v. 17, p. 531-33. 2d ed. 1776.

1776 ANON. The history of North America, containing an exact account of their first settlements, their situation, climate, soil, produce, beasts, birds, fishes . . . with the present state of the different colonies and a large introduction. Lond. 1776. [2] + 284 p. map.

1777 *BOSSU, J. B. *Nouveaux voyages dans l'Amérique Septentrionale, contenant une collection de lettres écrites sur les lieux,*

par l'auteur; à son ami, M. Douin . . . ci-devant son camarade dans le Nouveau Monde . . . Amsterdam, Changuion, 1777. xvi, 322 p. 3 pl. front.

Bossu's third visit to Louisiana in 1770-71. See above, 1768: *BOSST.

See also SABIN, v. 2, p. 301.

- 1778 *ALVAREZ, F[rancisco]. Noticia del establecimiento y poblacion de las colonias inglesas en la America septentrional; religion, orden de gobierno, leyes y costumbres de sus naturales y habitantes; calidades de su clima, terreno, frutes, plantas y animales . . . Madrid, Antonio Fernandez, 1778. 196 p. 4°.

Plants, p. 174-82.

*CARVER, Jonathan. Travels through the interior parts of North-America in the years 1766, 1767, and 1768 . . . London. Printed for the author, sold by J. Walter, 1778. 10+xvi, 17-543+[1] p. illus. pl. maps.

The work is sometimes attributed to Dr. John Coakley LETTSOM.

A comprehensive and well collated Bibliography of Carver's "Travels" may be found (In State Hist. Soc. Wis. Proc. for 1909. Madison, Wis., 1910. p. 143-83, port. 5 facsim.)

See also Amer. Hist. Rev. v. 11, p. 287-302. Jan. 1906 (E. G. Bourne).

A biogr. sketch & port. & repr. of p. 494-526 may be found in Lloyd Library, Cincinnati. Bull. no. 9. (Reprod. ser. no. 5. 1907)

Only a few of the numerous ed. pub. of this work are cited below. 2d English ed. London. Printed for the author by W. Richardson, 1779. 12, 1, xvi, [17]-543+[1] p. illus. pl. port. front. maps.

3rd English ed., with an account of the author, ed. by J. C. LETTSOM. Lond. C. Dilly, 1781. 2 p. 1, 22, [22], xvi, [17]-543+[21] p. illus. pl. port. maps.

Irish ed., Dublin, Printed for S. Price, 1779. 10 p. 1, xiii, [15]-508 p. 2 pl. map.

German ed., Hamburg, C. E. Bohm, 1780. xxiv, 456 p. map.

French ed., Paris, Pissot, 1784. 24, xxviii, 451 p. map.

Dutch ed., Leyden, 1796. 2 v. in 1. pl. map.

Scotch ed., Edinb., J. Key, 1798. xx, 21-380 p.

See also COUES (1), pt. 1, p. 585, 586, 591-92, & SABIN, v. 3, p. 382-83.

SOME AMERICAN EDITIONS

1st Amer. ed. entitled: THREE years travels through the interior parts of North-America, for more than five thousand miles, containing an account of the Great Lakes, and all the . . . north-west regions of that vast continent . . . Phila. Printed by J. Cruikshank, 1789. xvi, vii, [9]-282 p.

Another ed. Portsmouth, N. H., Printed by Charles Peirce for David West, 1794. (For pagination see preceding entry).

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v. 1, xxxvi+358 p.; v. 2, 1+[359-751 p.] Index auctorum, pref. p. 27-36. 2d. ed. Printed for J. Black. Lond. 1816. 2 v. in 1. Rev. in Amer. Monthly Mag. & Critical Rev. v. 2, p. 170-76. Jan. 1818, by Rafinesque. Also rev. in Med. Repos. v. 18 (n. s. v. 3), no. 3, p. 277-80. Aug. 1816.

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*BRADBURY, John. *Travels in the interior of America, in the years 1809, 1810, and 1811; including a description of Upper Louisiana, together with the states of Ohio, Kentucky, Indiana, and Tennessee, with the Illinois and western territories, and containing remarks and observations useful to persons emigrating to those countries.* Liverpool. Printed for the author by Smith & Galway, & London, Pub. by Sherwood, Neely & Jones, 1817. xii, 1, [9]–364 p.

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(In Thwaites, R. G. ed. *Early western travels.* v. 5.)

[EATON, Amos.] transl. *A botanical dictionary, being a translation from the French of Louis Claude Richard . . . with additions from Martyn, Smith, Milne, Wildenow, Acharius . . .* New Haven, H. Howe, 1817. 12°. vi, [7]–14, [154] p.

3d. ed. Albany, Webster & Skinner, 1828. 124 p.

———. *Manual of botany for the northern states . . . by the members of the botanical class in Williams' College, from a manuscript system, compiled . . . by the author of Richard's Botanical dictionary.* Albany, Webster & Skinner, 1817. 6+164 p.

2d ed. entitled *Manual of botany for the Northern and middle states.* Albany, 1818. 12+524 p.

3d ed. Albany, 1822, 536 p.; 4th ed., 1824. 539 p. 5th ed. 1829. 451+63+[69] p. 6th ed., 1833, 401+137 p. 7th ed., 1836, 672+125 p. 8th ed. with WRIGHT, John, 1840. viii, 625 p. illus (see under 1840—EATON & WRIGHT).

1st ed. rev. by Rafinesque in *Amer. Monthly Mag. & Critical Rev.* v. 1, p. 426–30. Oct. 1817.

HAYWARD, George. *Some account of an animal belonging to the genus Cervus.* (In *New England J. Med. & Surg.* v. 6, p. 153–56. 1817.)

HEUSTIS, J. W. *Physical observations, and medical tracts and researches, on the topography and diseases of Louisiana.* N. Y. Printed by T. & J. Swords, 1817. 165 p.

LONG, S. H. *Voyage in a six-oared skiff to the Falls of Saint-Anthony in 1817 . . .* St. Paul, Minn., 1860. (In *Minn. Hist. Soc. Coll.* v. 2, pt. 1, p. [7]–88.)

Reprinted from the MSS owned by Edwin JAMES.

MEADE, William. An experimental inquiry into the chemical properties and medicinal qualities of the principal mineral waters of Ballston and Saratoga in the state of New York, with direction for the use of those waters in the various diseases to which they are applicable . . . to which is added an appendix containing a chemical analysis of the waters of the Lebanon Spring in the state of New York. Phila. Harrison Hall, 1817. 15 + 195 p. pl.

- 1817 MICHAUX, F[rangois] André. The North American sylva; or, A description of the forest trees of the United States, Canada and Nova Scotia . . . to which is added a description of the most useful of the European forest trees . . . Paris. Printed by C. D'Hautel; Phila., Thomas Dobson, 1817-19. 3 v. 150 (156) col. pl. 4°.

This is the translation of Michaux's work originally written in French in 1810 (q. v.). Translated by Augustus L. Hillhouse. The section on OAKS was printed in 1817. In 1818-19 the work was reprinted in the U. S. and France simultaneously.

See also NUTTALL'S "North Amer. Sylva," under 1842. See also SABIN, v. 12, p. 138.

Due to the irregularities and various editions of the work there is given below a collation of copies of the work to be found in the Library of Congress, Arnold Arboretum, and the U. S. Dept. Agriculture, prepared by Miss Alice ATWOOD, bibliographer of the library of the U. S. Dept. Agric.

NORTH AMERICAN SYLVA

Collation

1817

Issue of portion on Oaks. Philadelphia. Sold by Thomas Dobson-Solomon Conrad, Paris, printed by C. d'Hautel 1817.

2 p. l., xii, 135 [1] p. pl. 1-28.

(half-title, t.-p., introd., text, table*)

The copy of this portion at the Arnold Arboretum has a pencil note on the fly-leaf signed C. E. F. (Charles E. Faxon) stating that this translation was later cancelled and that of Hillhouse substituted. Who made this first translation has not been discovered. It may have been Michaux himself.

vol. 1. 1819

Library of Congress. Paris, printed by C. d'Hautel 1819.

2 p. l., xii, 268, 1 l. pl. 1-50.

(half-title, t.-p., introd., text)

p. 136 is a table, also p. 267-268; the leaf at the end is blank save for a note at the foot: "N. For the translation of the present volume I

am indebted to my friend Augustus L. Hillhouse, of Connecticut, F. A. M.''

The text of p. 1-135 is the same as the 1817 issue, that is, it is not the Hillhouse translation.

Arnold Arboretum copy. Imprint same as above.

2 p. l., v, 268 p. (p. 112-136 being elided).

(half-title, t.-p., dedication & pref., text)

This is the Hillhouse translation.**

Two copies are quoted by Sabin, the first is like the Library of Congress copy, the second has the following collation: [6], v, 268 p.

vol. 2. 1818

Library of Congress. Philadelphia. Sold by Thomas Dobson, etc., (same as 1817 imprint) 1818.

2 p. l., 116 p., 2 l., [117]-250 p. pl. 51-100.

(half-title, t.-p., text, table, t.-p., text (incl. table))

The second t.-p. is for the "Fourth half-volume"

Arnold Arboretum copy.

2 p. l., 250 p.

(half-title, t.-p., text (incl. table))

Copies quoted by Sabin.

2 p. l., xii, 268, [1], p.

2 p. l., 247 p.

vol. 3. 1819

Library of Congress. Imprint same as v. 2 1819.

2 p. l., 82 p. 2 l., [83]-194 p., 2 l., [195]-285, [1] p. pl. 101-156.

(t.-p., text, table, t.-p., text, table, t.-p., text (incl. general table), errata.

Extra t.-ps. for Sixth and Seventh half-volumes.

* Table in every case means index.

** The Hillhouse translation by a brief mode of expression seems to have been able to condense the 135 pages on the Oaks into 112, numbering the latter page 112-136 to conform with the second part of the volume which begins at p. 137.

vol. 3. Imprint same as vol. 2. 1819.

Arnold Arboretum copy.

2 p. l., 82 p. 1 l., [83]-149 p., 1 l., 195-285, [1] p.

(half-title, t.-p., text, table, text, table, text (incl. general table), errata.

Plates are numbered: 101-133, 1, 135, 2-3, 138, 4-10, 146, 11-15, 151-156.

Copies quoted by Sabin for vol. 3 are alike; 2 p. l., 268, [1] p.

It is probable that Sabin took no account of the part t.-ps. and tables in midst of text.

2 vol. edition. 1819

U. S. Dept. of Agriculture Library.

vol. 1. Paris. Printed by C. d'Hautel 1819.

4 p. l., iii-v, 383 (*i.e.* 385) p., 1 l., pl. 175.

(half-title, t.p., dedication (to Jas. Hillhouse), pref. note by Michaux, pref. by A. L. Hillhouse, text (incl. introd. (p. 1-i), main text (p. 0-111, 112/136-382), table (p. 383-383 (*i.e.* 385), table (11.)

vol. 2. Imprint same as vol. 1.

2 p. l., 417, [1] p. pl. 76-156.

(half-title, t.p., text (incl. general table) errata)

Later edition, with notes by Jay J. Smith.

First published at Philadelphia by R. P. Smith, 1853; a later ed. published at the same place in 1857 by D. Rice & A. N. Hart, states in the preface that the "whole of the sheets of the last imprint were destroyed by fire at the bindery," the original French copper plates were fortunately in another building and so were saved. "This enabled the new publishers to issue the work in a much improved style, and has allowed opportunity for additional notes and remarks."

Vol. 1: The text is the same for both editions, save for the portion on the oaks, which has notes in square brackets in the 1857 ed., not in that of 1853.

Vol. 2: Notes appear in the 1857 edition signed Jan. 1857, as well as unsigned additions to notes which had appeared in the 1853 ed.

MUHLENBERG, [G. H. E.] D. Henrico. *Descriptio uberior graminum et plantarum calamariarum Americae Septentrionalis indigenarum et cicurum* . . . Phila. S. W. Conrad, 1817. 2 + 295 p.

Preface dated, Lancaster, Pa., July, 1816.

PECK, W. D. On the insects which destroy the young branches of the pear-tree and the leading shoot of the Weymouth pine. (In *Mass. Agric. Repos. & Jour.* v. 4, p. 205-11, pl. Jan. 1817)

RAFINESQUE, C. S. & ROBIN, C. C. *Florula Ludoviciana*; or, A flora of the state of Louisiana; tr., revised and improved from the French of C. Robin. N. Y., Wiley 1817. 178 p.

See 1807: *ROBIN, C. C.

SAY, Thomas. *American entomology*; or, Descriptions of the insects of North America, illustrated by colored figures. Phila. 1817. 6 col. pl.

Includes descriptive letter-press.

1818 BARTON, B. S. Some account of the *Tantalus ephouskyca*, a rare American bird. (In *Linn. Soc. London. Trans.* v. 12, p. 24-7, pl. 1818)

BARTON, W. P. C. *Compendium florae Philadelphicae*: containing a description of the indigenous and naturalized plants found within a circuit of ten miles around Philadelphia. Phila. M. Carey & Sons, 1818. 2 v. 12 mo.

Preface dated July 11, 1818. v. 1, 6+251 p.; v. 2, 234 p. Index, v. 2, p. 220-34.

DARBY, William. The emigrant's guide to the western and south-western states and territories; comprising a geographical and statistical description of the states of Louisiana, Mississippi, Tennessee, Kentucky, and Ohio; the Territories of Alabama, Missouri, Illinois and Michigan; and the western parts of Virginia, Pennsylvania, and New York . . . N. Y., Kirk & Mercein, 1818. 6, 311 p. 2 maps.

See also *North Amer. Rev.* v. 8, p. 268. 1819.

BLAND, Theodorick. Report on South America . . . Wash. 1818. 147 p. (In U. S. 15th Cong. 2 sess. H. Ex. Doc. v. 2, no. 48), Serial no. 18.

Argentine, Chile, etc.

*COBBETT, William. A year's residence in the United States of America, treating of the face of the country, the climate, the soil, the products, the mode of cultivating the land . . . N. Y. Printed for the author by Clayton & Kingsland 1818. In 3 pts. 432 p. 12 mo.

Numerous other editions. See also SABIN, v. 4, p. 189-90.

EATON, Amos. An index to the geology of the northern states, with a transverse section from Catskill Mountain to the Atlantic. Prepared for the geological classes at Williams College, Northampton, Belchertown, Leicester, and Worcester, Mass. Leicester, Mass. Printed by H. Brown, 1818. 52 p. 1 fold. pl.

2d ed., Troy, N. Y., Published under the direction of the Troy Lyceum, 1820. xi, 1, 103-286 p. 2 pl. Rev. in *North Amer. Rev.* v. 11, p. 225-39, Oct. 1820; & in *Amer. Mthly Mag. & Critical Rev.* v. 3, p. 175-78. July, 1818, by C. S. Rafinesque.

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ESSEX AGRICULTURAL SOCIETY. Transactions. Salem, Mass., 1818-date.

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Repr. as "Description of the European olive tree." [Paris, 1818.] 43 p. 1 pl.

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According to Sabin, v. 1, p. 315-16, q.v., "the plates were published without any text to avoid the necessity of furnishing copies gratis to the public libraries in England, agreeably to the law of copyright." The TEXT was pub. in 1831 (q.v.) under title of "Ornithological biography."

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Plate 64 drawn from nature by Lucy AUDUBON.

Plates 1-2, 6-7 engraved by W. H. LIZARS, retouched by Robert HAVELL, Jr.; pl. 8-9, engraved by Lizars; pl. 3-5, 101-105, 108, 110, engr., printed and colored by Robert HAVELL, Jr.; pl. 10-100, 106-107, 112-435, engr., printed and colored by Robert HAVELL, Sr. Another edition. N. Y. J. J. Audubon; J. B. Chevalier, 1840-44. 7 v. 435 col. pl. Royal 4°. (Issued in 100 parts). Reissued in 1856.

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CHRONOLOGICAL TABLES OF THE PUBLICATIONS OF THE DIFFERENT INSTITUTIONS CONTAINED IN THIS WORK

Arranged by Decades: 1 to 10

Abbreviations Used

A	—Annals	J	—Journal
Ac	—Account	M	—Memoirs
Ad	—Address	M.C.	—Miscellaneous Collections
Agr	—Agriculture	Mem	—Memorial
Bot	—Botany	Min	—Mineralogy
Bul	—Bulletin	N	—Narrative
C	—Contributions	P	—Proceedings
Cat	—Catalogue	Pa	—Papers
Ch	—Charter	Pal	—Palaeontology
Cir	—Circular	R	—Report
Col	—Collections	Rem	—Reminiscences
Con	—Constitution	S	—Supplement
D	—Discourse	Sc	—Science(s)
Dir	—Directions	S.C.	—Smithsonian Contributions to Knowledge
Dis	—Discovery	St	—Statement
Doc	—Documents	Syn	—Synopsis
G	—Geology	T	—Transactions
Gu	—Guide	Z	—Zoology
In	—Index		

CHRONOLOGICAL TABLES OF PUBLICATIONS

Decade 3.—1790-1799

INSTITUTION	90	91	92	93	94	95	96	97	98	99
Amer. Phil. Soc. (1769)				T 3						T 4
Charleston Mus. (1775)				M						
Amer. Acad. A. & Sc. (1780)				2:1			Cat			
Peale's Mus. (1784)										
Univ. State N. Y. (1787)					T 1:2				T 1:3	T 1:4
Soc. Prom. Agr. A. & Manuf. (1791)			T 1:1					1	1, 2 Cir	2, 3
Med. Repos. (1797)										
Amer. Min. Soc. (1798)										
Conn. Acad. (1799)										

CHRONOLOGICAL TABLES OF PUBLICATIONS

Decade 7.—1830-1839

INSTITUTION	30	31	32	33	34	35	36	37	38	39
Amer. Phil. Soc. (1769)	T ns. 3				T ns. 4			T ns. 5	P 1	P 1 T ns. 6
Charleston Mus. (1773)				M ns. 1						
Amer. Acad. A. & Sc. (1780)				R 46		R 48		R 50	R 51	R 52
Univ. St. N. Y. (1787)		R 44	R 45					J 7:2		J 8:1
Conn. Acad. (1799)										
Cambridge Bot. Gard. (1805)										
Acad. Nat. Sc. Phila. (1812)		J 6:2			J 7:1					
Lit. & Phil. Soc. S. C. (1813)										
Columbian Inst. Prom. Sc. (1816)										
Lyc. Nat. Hist. N. Y. (1817)	In					Con	A 3			R
Amer. J. Sc. (1818)	17:2 18 19:1	19:2 20 21:1	21:2 22 23:1	23:2 24 25:1	25:2 26 27:1	27:2 28 29:1	29:2 30 31:1	31:2 32 33:1	33:2 34 35:1	35:2 36 37:1
Troy Lyc. Nat. Hist. (1818)										
Prov. Franklin Soc. (1821)										
Amherst Coll. Cab. (1822)										
Maryland Acad. Sc. (1822)										
N. C. Geol. Surv. (1823)										
Albany Inst. (1824)	T 1			T 2				T 1		

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Decade 7.—1830-1839 (cont.)

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Decade 7.—1830-1839 (cont.)

INSTITUTION	30	31	32	33	34	35	36	37	38	39
Schoolcraft & Allen Exped. (1832)										
Delaware Co. Inst. (1833) . . .					J, N					
Essex Co. Nat. Hist. Soc. (1833) .					R	R	J 1:1 R	R	R	J 1:2 R
Maryland Geol. Surv. (1833)										
U. S. Naval Lyc. (1833)					1	R				
Advocate Sc. (1834)						1				
Featherstonhaugh Surv. Mo. R. (1834)						R				
Conn. Geol. Surv. (1835)								R		
Dodge Exped. (1835)										
Featherstonhaugh Surv. Coteau (1835)							R			
Mag. Hort. & Bot. (1835)						1	R			
Nat. Hist. Soc. Hartford (1835) . .							2	3	4	5
N. J. Geol. Surv. (1835)							T 1			
Va. Geol. Surv. (1835)							R	R	R	R
Western Acad. Nat. Sc. Cincinnati (1835)							R	R	R	
Williams Coll. Lyc. Nat. Hist. (1835)										
Georgia Geol. Surv. (1836)										
Maine Surv. (1836)							R	2 R	2 R	2 R

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Decade 8.—1840-1849 (cont.)

INSTITUTION	40	41	42	43	44	45	46	47	48	49
Maine Geol. Surv. (1836)										
Nat. Hist. Surv. N. Y. (1836) . .	R 4	R 5	Z 1,3,4 Min G 2,3	Z 5 Bot 1,2 G 1,4 R	Z 2, 6	R	Agr 1	Pal 1		Agr 2
Nicollot's Explor. (1836)										
Penn. Geol. Surv. (1836)	R 4	R 5	R 6							
U. S. Commis. Pat. (1836)										
Western Acad. St. Louis (1836) .		R								
Delaware Geol. Surv. (1837) . .										
Harvard Nat. Hist. Soc. (1837) . .									Ad	
Indiana Geol. Surv. (1837)										
Michigan Geol. Surv. (1837) . . .	R	R	R	R	R					
Ohio Geol. Surv. (1837)			Cat							
Univ. Mich. Mus. (1837)										
Zool. & Bot. Surv. Mass. (1837) .	R	2 R					R			
Wilkes Explor. Exped. (1838) . . .		R	Syn		N 1-5		6		7, (8), 9	10
Agric. Hort. Bot. Soc. (1839) . .		Ad	Ad							
N. H. Geol. Surv. (1839)		R	R		R					
Owen's Surv. Iowa, Wis. & Ill. (1839)	R				R					

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Decade 9.—1850-1859

INSTITUTION	50	51	52	53	54	55	56	57	58	59
Amer. Phil. Soc. (1769)	P 5	P 5	P 5	P 5 T n. s. 10	P 6	P 6	P 6	P 6	P 6	P 7
Charleston Mus. (1773)										
Amer. Acad. A. & Sc. (1780)	P 2 M ns. 4:2	P 2	P 2, 3	P 3 M ns. 5:1	P 3	P 3 M ns. 5:2	P 3	P 3, 4 M ns. 6:1	P 4 M ns. 6:2	P 4
Univ. St. N. Y. (1787)		R 64	R 65	R 66	R 67					
Conn. Acad. (1799)										
Cambridge Bot. Gard. (1805)										
Acad. Nat. Sc. Phila. (1812)	P 5 J ns. 1:4 & 2:1	P 5	P 6 J ns. 2:2	P 6 J ns. 2:3	P 7 J ns. 2:4	P 7 J ns. 3:1-2	P 8 J ns. 3:3	P 9	P 10 J ns. 3:4 & 4:1	P 11 J ns. 4:2
Lyc. Nat. Hist. N. Y. (1817)		D, A 5	A 5	A 6	A 6	A 6	A 6		A 6, 7	A 7
Amer. J. Sc. (1818)	59 60	61 62	63 64	65 66	67 68	69 70	71 72	73 74	75 76	77 78
Troy Lyc. Nat. Hist. (1818)	Con									
Franklin Soc. Prov. (1821)										
Amherst Coll. Cab. (1822)										
Maryland Acad. Sc. (1822)										

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INSTITUTION	50	51	52	53	54	55	56	57	58	59
Nat. Hist. Surv. N. Y. (1836)		Agr 3,4	Pal 2		Agr 5					Pal 3
Penn. Geol. Surv. (1836)		R	R	R		R	R	R	R, 3v R	R
U. S. Commiss. Pat. (1836)				Ad	R					
Harvard Nat. Hist. Soc. (1837)										
Indiana Geol. Surv. (1837)										
Michigan Geol. Surv. (1837)										
Wilkes Explor. Exped. (1838)		11	12, 13	14	15, 16 19	Cat P ns. 1:1	P ns. 1:2	P ns. 1:3	8, 20 23	17
Nat. Inst. Prom. Sc. (1840)	R									
Amer. Ethnol. Soc. (1842)		T 3								
N. Y. St. Cab. Nat. Hist. (1843)	R 4	R 5	R 6	R 7 Cat	R 8	R 9	R 10	R 11	R 12	R 13
Portland Soc. Nat. Hist. (1843)		Con								
Vermont Geol. Surv. (1844)	Ad						R	R	R	R
Cleve. Acad. Nat. Sc. (1845)		P	P	P	P	P	P	P	P	P
Charleston Med. Jour. (1846)	5	6			9	10				
Ohio Agric. Repts. (1846)		6				10			12	14

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INSTITUTION	50	51	52	53	54	55	56	57	58	59
Smithsonian Inst. (1846)	R 5	R 6 S.C. 2	R 7 SC 3, 4 M.C. 2	R 8 S.C. 5	R 9 S.C. 6	R 10 S.C. 7	R 11 S.C. 8 M.C. 1	R 12 S.C. 9	R 13 S.C. 10 M.C. 3	SC. 11 R 14 M.C. 1, 3
Alabama Geol. Surv. (1848)	R 1								R 2	P 12
Amer. Assoc. Adv. Sc. (1848)	P 2, 3	P 4, 5	P 6					P 10	P 11	P 2
Essex Inst. (1848)	P 1	P 1	P 1	P 1			P 1, 2	P 2	P 2	
Owen's Surv. Wis., Ia. & Minn. (1848)			R							
U. S. & Mexican Bdry. Surv. (1848)		R 2	R	N				R	R	R
Foster & Whitney Surv. (1849)	R 1									
Gilliss Exped. (1849)										
Marcy's Exped. (1849)	R					R	R			
Pope's Explor. Minn. (1849)	R									
Reconn. Routes (1849)	R									
Simpson's Surv. (1849)	2 R									
Stansbury's Explor. (1849)			R							
U. S. Surv. Cal. & Ore. (1849)	R	R								
U. S. Surv. Creek Bdry. (1849)										
Ann. Sc. Disc. (1850)	1	2	3	4	5	6	7	8	R	10
Derby's Recon. (1850)			2 R						9	

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INSTITUTION	50	51	52	53	54	55	56	57	58	59
Mississippi Geol. Surv. (1850) .			•	R	R			R	R	
Herdon & Gibbon Exped. (1851) .				R	R			R		
Illinois Geol. Surv. (1851) .				R	R			R		
Lee's Dolphin Exped. (1851) . .				R	R					
Sitgreaves' Zuni Exped. (1851)										
Soc. Adv. Nat. Sc. Louisville (1851)										
Wis. St. Agric. Soc. (1851) .			T 2	T 3	T 4	T 4				Con
Annals Sc. (1852)			1	1, 2	2					
Kane's Exped. (1852)				R	N	R	N			
Marcy's Explor. Red River (1852) .										
Perry's U. S. Japan Exped. (1852) . .										
Cal. Acad. Nat. Sc. (1853) . . .				R	P 1	P 1	R, 3v. P 1	P 1	P 2	P 2
Cal. Geol. Surv. (1853)				P 1	R	R	R	P 1	P 1	P 2
Elliott Soc. Nat. Hist. (1853)				P 1	P 1	P 1	P 1	Con	J 1	J 1
Flint Inst. (1853) . . .								Con		
Florida Surv. (1853)					R					
Illinois St. Agric. Soc. (1853) .				T 1	T 1	T 1	T 2	T 2	T 3	T 3, 4
Mining Mag. (1853)				1	2, 3	4, 5	6, 7	8, 9	10, 11	ns. 1

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INSTITUTION	60	61	62	63	64	65	REMARKS
Amer. Phil. Soc. (1769)	P 7 T ns. 11	P 8	P 9	P 9 T ns. 12	P 9	P 10	T ns. 13, pub. 1869
Charleston Mus. (1773)							
Amer. Acad. A. & Sc. (1780) .	P 4, 5 M ns. 7	P 5 M ns. 8:1	P 5, 6	P 6 M ns. 8:2	P 6	P 6, 7	M ns. 9, pub. 1867-73
Conn. Acad. (1799)							T 1, pub. 1866
Cambridge Bot. Gard. (1805) . .							
Acad. Nat. Sc. Phila. (1812) .	P 12 J ns. 4:3-4	P 13	P 14 J ns. 5:1-2	P 15 J ns. 5:3-4	P 16	P 17	J ns. 6, pub. 1866
Lyc. Nat. Hist. N. Y. (1817) .	A 7	A 7	A 7	A 8	A 8, Con	A 8	A 8, pub. 1863-67
Amer. J. Sc. (1818)	79, 80	81, 82	83, 84	85, 86	87, 88	89, 90	
Prov. Franklin Soc. (1821) . . .			Cat	Rem			
Amherst Coll. Cab. (1822) . . .							
Maryland Acad. Sc. (1822)							
N. C. Geol. Surv. (1823)		R					Curtis' Bot., 1867
Albany Inst. (1824)	3 R				T 4		T 5, 1867
S. C. Geol. Surv. (1824)	2 R						
Chester Co. Cab. (1826)							

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Decade 10.—1860–1865 (cont.)

INSTITUTION	60	61	62	63	64	65	REMARKS
Bost. Soc. Nat. Hist. (1830) . . .	P 7 J 7:1-2	P 7, 8 J 7:2-3	P 8, 9 J 7:3	P 9 J 7:4 M 1:1	P 9 M 1:1	P 9, 10 M 1:1 R	M 1:1-4, 1866-69
Mass. Geol. Surv. (1830) .						R	
Tenn. Geol. Surv. (1831) .	R					R	Final R, 1869
N. Y. St. Agric. Soc. (1832)	T 20	T 21	T 22	T 23	T 24	T 25	
Delaware Co. Inst. (1833) .			Cat				
Maryland Geol. Surv. (1833) .	R		R				
Mag. Hort. & Bot. (1835)	26	27	28	29	30	31	
N. J. Geol. Surv. (1835) .			R	R	R	R	
Maine Geol. Surv. (1836) . . .							
Nat. Hist. Surv. N. Y. (1836) . .		Pal 3	R	R	R	R	
U. S. Commiss. Pat. (1836) .	R	R	R	R	R	R	
Indiana Geol. Surv. (1837) . . .			R				
Harvard Nat. Hist. Soc. (1837)							
Michigan Geol. Surv. (1837)		R					
Univ. Mich. Mus. (1837)		Cat		R			
Wilkes Explor. Exped. (1838)			17				
Amer. Ethnol. Soc. (1842)							
N. Y. St. Cab. Nat. Hist. (1843) . .	R 14	R 15	R 16	R 17	R 18	R 19	Last of 17 pub. 1874

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INSTITUTION	60	61	62	63	64	65	REMARKS
Portland Soc. Nat. Hist. (1843)			P 1:1		J 1:1		P 1:2 in 1869
Vermont Geol. Surv. (1844)		R	R				Proc. 1845-59, pub. 1874
Cleve. Acad. Nat. Sc. (1845)							
Ohio Agric. Repts. (1846)	15	16	17	18	19	20	
	S. C 12		R 17	R 18	R 19	B 20	
Smithsonian Inst. (1846)	R 15	R 16	M. C.	S. C. 13	M. C.	S. C. 14	S. C. 15, pub. 1867
	M. C.	M. C.	3, 4, 5, 6	M. C.	5, 6		
	1, 2, 3	3, 4		5, 6			
Amer. Assoc. Adv. Sc. (1848) .	P 13	P 14					
Essex Inst. (1848)	P 2, 3	P 3	P 3	P 3	P 4	P 4, Con	
Ann. Sc. Disc. (1850)	11	12	13	14	15	16	
Mississippi Geol. Surv. (1850)	R		R				
Illinois Geol. Surv. (1851) .							G & Pal 2 v., 1866
Soc. Adv. Nat. Sc. Louisville (1851)							
Cal. Acad. Nat. Sc. (1853) .	P 2	P 2	P 2	P 3	P 3	P 3	
Cal. Geol. Surv. (1853)		Ad	Ad	R	R, Pal	G	Pal 2, 1869 Ornith., 1870
Elliott Soc. Nat. Hist. (1853) .	J 1, P 2	T 5	T 5	T 5	T 5	T 6	
Illinois St. Agric. Soc. (1853)	T 4						

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INSTITUTION	60	61	62	63	64	65	REMARKS
Mining Mag. (1853)	ns. 1						
Missouri Geol. Surv. (1853) . . .		R					
New Orleans Acad. Sc. (1853) . . .				Cat			
Pacific RR. Surv. (1853)	12						
Wisconsin Geol. Surv. (1853) . . .		R	G	R			
Kentucky Geol. Surv. (1854) . . .		R 4					
Wisconsin Nat. Hist. Assoc. (1855).	Con						Con., 1866
Acad. Sc. St. Louis (1856)	T 1				T 2	T 2	
Chicago Acad. Sc. (1856)						Con	T 1, in 1867
Arkansas Geol. Surv. (1857) . . .	R 2						
Ives' Exped. (1857)		R					
Michler's Exped. (1857)		R					
Northwest Bdry. Surv. (1857) . .	R						
Illinois Nat. Hist. Soc. (1858)		T 1					
Mullan's Exped. (1858)							
Simpson's Utah Exped. (1858)				R			Final R, in 1876
Texas Geol. Surv. (1858)							R, 1866
Wyoming Hist. & Geol. Soc. (1858).							
Ent. Soc. Phila. (1859)		P 1	P 1	P 1, 2	P 2, 3	P 4, 5	

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INSTITUTION	60	61	62	63	64	65	REMARKS
Macomb. Exped. (1859)	R	R				R	R, in 1876
Minn. Geol. Surv. (1859)	R	R	R	R	R	R, Bul	3 R, in 1866
Mus. Comp. Zool. (1859)							
Raynolds' Exped. (1859)							
Wilmington Inst. (1859)	Cat						R, 1868
Hall's Exped. (1860)						N	
Hayes' Exped. (1860)		R					N, 1867
Isthmus Chiriqui Exped. (1860)		R					
Buffalo Acad. (1861)					Cat		
Linn. Soc., Lancaster, Pa. (1862)							Hist., 1866
Ward Mus. (1862)				Ad	Ad		
Nat. Acad. Sc. (1863)				R	R	R	
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Louisiana Surv. (1864)							R, 1867
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- ATWOOD, Nathaniel Ellis** [1807-1886]
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- AUDUBON, John James Laforest** [1780-1851]
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- AUDUBON, John Woodhouse** [1812-1862]
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- BARTON, Benjamin Smith** [1766-1815]
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- BLACKIE, George Stodart** [1834-1881]
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- BRERETON, John Andrew** [1787-1839]
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- BRETTON, Frederick de**
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- BREVOORT, Henry**
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- BREVOORT, James Carson** [1818-1887]
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- BREWER, J. M.**
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- BREWER, Thomas Mayo** [1814-1880]
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- BREWER, William Henry** [1828-1911]
Amer. Acad. A. & Sc. (1780), **II**, 56, (see GRAY, ASA, 1865)
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- *BRICKELL, John** [English: 1710-1745?]
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- BRICKELL, John** [American: 1749-1809]
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- BRIDGEMAN, Thomas** [-1850]
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- BRIDGES, Robert** [1806-1882]
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- BRIDGES, Thomas, (or BRYDGES)**
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- BRIDGMAN, E. C.**
Assoc. Amer. Geol. & Nat. (1840), **II**, 687, (see HITCHCOCK)

- BRIGGS, Caleb, Jr.** [1812-1884]
 Virginia Geol. Surv. (1835), **II**, 592
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- BRIGGS, [Robert]**
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- BRIGHAM, William T.**
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- BRINCKERHOFF, Dr. Isaac W.** [1821-1910]
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- BRINCKLE, William Draper** [1798-1862]
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- BRINGHURST, Edward**
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- BRINGIER, L.**
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- BRINTON, Caleb, Jr.**
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- BRINTON, J. H.**
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- BROADHEAD, Garland Carr** [1827-1912]
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- BROCKLESBY, John** [1811-1889]
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- BRODHEAD, J. R.**
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- ***BRONGNIART, Alexander**
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- BROOKS, Thomas Benton** [1836-1900]
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- BROWN, A. H.**
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- BROWN, Andrew D.**
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- BROWN, F. B. E.**
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- BROWN, J. T.**
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- BROWN, John**
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- BROWN, Ryland Thomas**
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- BROWN, Samuel** [1769-1830]
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- BROWNE, Daniel Jay** [-]
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- BROWNE, Peter Arrell** [1782-1860]
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- BROWNE, Robert H.** [1810-1879]
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- BRUCE, Archibald** [1777-1818]
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- BRUCKERT, H. G.**
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- BRUMLEY, R. T.**
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- BRUSH, George Jarvis** [1831-1912]
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- BRUYN, S. J.**
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- BRY, H.**
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- BRYAN, Francis Theodore** [1823-1917]
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- BRYANT, Henry** [1820-1867]
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- BRYANT, William**
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- BUCHANAN, Robert** [1797-1879]
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- *BUCKLAND, William**
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- BUCKLEY, Samuel Botsford** [1809-1884]
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- BUCKMAN, James**
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- BUDD, Bern W.**
 Amer. Phil. Soc. (1769), **II**, 29, (see LEA, I., 1846)
- BUDD, Thomas**
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- BUEL, David, Jr.**
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- BUEL, Jesse W.**
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- BUIST, Robert** [1805-1880]
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- BULFINCH, Thomas** [1796-1867]
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- BULKLEY, John**
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- BULL, Col.**
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- BULL, Lucius**
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- BULLIVANT, Benjamin**
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- BULLOCK, William R.**
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- *BUNBURY, C. J. F.**
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- BUNKEE, J. M.**
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- BURDETT, Charles**
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- BURGESS, Ebenezer**
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- BURGESS, Thomas M.**
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- BURNETT, Joel**
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- BURNETT, Waldo Irving** [1828-1854]
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- BURNHAM, John A.**
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- BURR, C. D.**
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- BURRALL, William**
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- BURT, John**
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- BURT, William A.**
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- BURTT, J. L.**
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- BUSSIÈRE, Paul**
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- BUTTRICK, Samuel Bartlett** [1801-1887]
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- BYRNE, J. H.**
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- CABELL, P. H.**
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- CABOT, James Elliot** [1821-1903]
 Bost. Soc. Nat. Hist. (1830), **II**, 463
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- CABOT, Samuel Jr.** [1815-1885]
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- CAFFERY, J.**
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- CAIN, J. D.**
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- CALDWELL, Charles** [1772-1853]
 Transylvania J. Med. & Assoc. Sc. (1828), **II**, 455 (2)
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- CALDWELL, Elias B.**
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- CALDWELL, Joseph & T.**
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- CALDWELL, William**
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- CALHOUN, John Caldwell** [1782-1850]
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- CAIKINS, Alonzo**
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- *CALLENDER, J. A.**
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- CAMAC, William**
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- CAMPBELL, Albert H.**
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- CAMPBELL, Archibald**
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- CAMPBELL, John**
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- CAMPBELL, R. B.**
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- CAMPBELL, William**
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- CANBY, William Marriott** [1831-1904]
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- CAPERS, C.**
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- CARADEAUX, M.**
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- CARANDEFEZ, Alexis de**
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- CAREY, John** [1797-1880]
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- CAREY, Samuel Thomas**
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- CARLETON, James Henry** [1814-1873]
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- CARLEY S. T.**
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- CARPENTER, George Washington** [1802-1860]
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- CARPENTER, James S.**
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- *CARPENTER, Philip Pearsall** [1802-1877]
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- CARPENTER, W. M.**
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- CARR, Ezra Slocum** [1819-1894]
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- CARR, John B.**
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- CARR, Robert** [1767-1866]
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- CARSON, Kit**
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- CARTER, Landon**
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- CARTER, N. H.**
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- CARTER, William**
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- CARVER, S. D.**
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- CASAMAJOR, P.**
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- CASE, William**
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- CASS, Lewis** [1782-1866]
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- CASSELS, John Lang** [1808-1879]
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- Bost. Soc. Nat. Hist. (1830), **II**, 457, 458, 462
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- CHANNING, William Francis** [1820-1901]
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- CHAPIN, A. B.**
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- CHAPMAN, Alvin Wentworth** [1809-1899]
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- CHAPMAN, Isaac**
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- CHAPMAN, Nathaniel**
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- CHAPMAN, Reuben A.**
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- ***CHARLEVOIX, Pierre Francois Xavier de** [1682-1761]
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- CHASE, George J.**
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- ***CHASTELLUX, Francois Jean de** [1734-1788]
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- CHAUVENET, William**
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- ***CHENU, Jean Charles** [1808-1879]
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- CHESTER, A. T.**
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- CHICKERING, John White, Jr.** [1831-1913]
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- CHILTON, George** [1767-1836]
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- CLAPP, Asahel** [1792-1862]
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- CLARK, Arabella**
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- CLARK, H. R.**
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- CLARK, Joseph**
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- CLARK, M. L.**
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- CLARK, William S.**
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- CLARKE, Daniel**
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- CLARKE, Samuel**
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- CLEMSON, William F.**
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- CLINTON, De Witt** [1769-1828]
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- COGSWELL, Joseph Green** [1786-1871]
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- COGSWELL, William** [1787-1850]
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- COOKE, Josiah Parsons, Jr.** [1827-1894]
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- COOPER, James Graham** [1830-1902]
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- COUCH, Darius Nash** [1822-1897]
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- COUTHOUY, Joseph Pitty** [1808-1864]
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- COWAN, Frank** [1844-1905]
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- COX, Edward Travers** [1821-1907]
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- COZZENS, Frederick S.**
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- COZZENS, Issacher, Jr.** [1780-1865]
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- CREUTZFELD, F.** [-1853]
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- CROFT, C.**
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- CROOM, Hardy Bryan** [1799-1836]
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- CROPLEY, Richard**
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- DU COMMON, Joseph**
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- DUDLEY, Paul** [1675-1751]
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- DUDLEY, William**
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- DUDLEY, William**
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- DUNBAR, George Powers** [1812-1850]
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- DUNBAR, William** [1749-1810]
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- DUNCAN, J. K.**
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- DUNCAN, William H.**
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- DUNGLISON, Robley** [1798-1869]
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- DUNLAP T.**
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- DUPEE, J. A.**
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- DU PONCEAU, Peter Stephen** [1760-1844]
 Amer. Phil. Soc. (1769), **II**, 2, 5, 6
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- DU PONT, Alfred**
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DWIGHT, Henry E.

Amer. J. Sc. (1818), **II**, 284

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DWIGHT, Sereno Edwards [1786-1850]

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DWIGHT, Timothy

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- EATON, Daniel Cady** [1834-1895]
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- Perry's U. S. Japan Exped. (1852), **III**, 146, 148
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- EATON, F. B.**
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- EATON, Hezekiah Hulbert** [1809-1832]
 Transylvania Jour. Med. & Assoc. Sc. (1828), **II**, 455, (with SHORT), 456
- EBERLE, John** [1788-1838]
 Transylvania J. Med. & Assoc. Sc. (1828), **II**, 455
- ECKLEY, David**
 Bost. Soc. Nat. Hist. (1830), **II**, 460
- EDDY, Caspar Wistar** [1790-1828]
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 N. Y. Lye. Nat. Hist. (1817), **II**, 235, 239, 244, 245, 248, (see TORREY, ed.)
- EDDY, E. B.**
 Essex Inst. (1848), **III**, 92, (see BARDEN)
- EDDY, F. A.**
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- EDDY, J. H.**
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- EDDY, Thomas**
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- EDDY, W. D.**
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- EDGAR, S. M.**
 Amer. Phil. Soc. (1769), **II**, 26 (with LEA, I.)
- EDMONSTON,**
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- EDWARDS, Amory**
 Phila. Acad. Nat. Sc. (1812), **II**, 173
- EDWARDS, Arthur Mead** [1836-1914]
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- EDWARDS, L. A.**
 Pacific RR. Surv. (1853), v. 8-10, **III**, 197
- EDWARDS, Timothy**
 Amer. Acad. A. & Sc. (1780), **II**, 43
- EDWARDS, William Henry** [1822-1909]
 Phila. Acad. Nat. Sc. (1812), **II**, 205, 208
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- EGLESTON, Thomas** [1832-1900]
 N. Y. Lye. Nat. Hist. (1817), **II**, 272, (with STEVENS & LAWRENCE)
 Amer. J. Sc. (1818), **II**, 382, (with STEVENS)

- Smith. Inst. (1846), **III**, 39
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- EGLOFFSTEIN, F. W. von**
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- ***EHRENBERG, Christian Gottfried** [1795-1876]
 Amer. J. Sc. (1818), **II**, 334
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- EIGHTS, James** [1798-1882]
 N. Y. Lyc. Nat. Hist. (1817), **II**, 260
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 Amer. Quart. Jour. Agric. & Sc. (1845), **III**, 3 (3), 4 (2)
 Mining Mag. (1853), **III**, 181 (2), 182 (2)
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- ELDERHORST, William** [1828-1861]
 Arkansas Geol. Surv. (1857), **III**, 269, 270 (2)
- ELDREDGE, N. T.**
 Books, (1837), **III**, 422
- ELIOT, Samuel, Jr.**
 Wash. Bot. Soc. (1817), **II**, 274
- ELIOT, S. A.**
 Bost. Soc. Nat. Hist. (1830), **II**, 460
- ELLERY, J. G.**
 Mining Mag. (1853), **III**, 175
- ELLETT, Charles, Jr.** [1810-1862]
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- ELLICOTT, Andrew** [1758-1820]
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- ELLINGWOOD, J. P.**
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- ELLIOT, Daniel Giraud** [1836-1915]
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- ELLIOT, William**
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- ELLIOTT, Benjamin**
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- ELLIOTT, Stephen** [1771-1830]
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- ***ELLIS, John** [1710-1776]
 Amer. Phil. Soc. (1769), **II**, 10, 16
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- ELMORE, S. E.**
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- ELWYN, Alfred Langdon**
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- ELY, A. W.**
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- ELY, J. M.**
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- ELY, J. W. C.**
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- ELY, William**
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- EMBREE, Jesse**
Western Mus. Soc. (1818), **II**, 391
- EMERSON, Benjamin Kendall** [1843-]
Hall's Exped. to Arctic Regions (1860), **III**, 311, 312, (see NOURSE)
- EMERSON, George Barrell** [1797-1881]
Amer. Acad. A. & Sc. (1780), **II**, 40
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- EMERSON, George H.**
Amer. Acad. A. & Sc. (1780), **II**, 56
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- EMERTON, James Henry** [1847-]
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- EMMONS, Ebenezer** [1799-1863]
Amer. Phil. Soc. (1769), **II**, 30
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- EMMONS, Stephen**
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- EMORY, William Hemsley, [or Helmsley]** [1811-1887]
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- ENGEL, P. M.**
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- ENGELMANN, George** [1809-1884]
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Amer. Acad. A. & Sc. (1780), **II**, 51
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- EVERETT, Oliver**
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- EWBANK, Thomas** [1792-1870]
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- FAHNESTOCK, George Wolff** [1823-1868]
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- FAHS, C. F.**
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- FAIRBANK, S. B.**
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- FAIRLIE, James**
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- FARNHAM, Charles S.**
Buffalo Soc. Nat. Sc. (1861), **III**, 315
- FARNHAM, J. H.**
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- FARNHAM, T. J.**
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- FARRAND, Nathan**
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- FARRINGTON, A. C.**
Amer. Assoc. Adv. Sc. (1818), **III**, 66, 67 (2)
- FARRIS, Charles**
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- FARWELL, Leonard J.**
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- FAY, H. T.**
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- FAYSSOUX, Peter Dott** [1745-1795]
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- FEATHERSTONHAUGH, George William** [1780-1866]
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- FELLNER, John**
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- FELDMAN, Henry**
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- FELLOWS, Dr.**
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- FENDLER, Augustus** [1813-1883]
Amer. Acad. A. & Sc. (1780), **II**, 46, (see GRAY, ASA, & SULLIVANT,
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Abert's Examination New Mexico (1846), **III**, 10, 11, (see G. & S.)
- FENN, H. N.**
Amer. J. Sc. (1818), **II**, 294, (see WEBB)
- FENTON, Jotham**
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- FERGUSON, William**
Amer. Phil. Soc. (1769), **II**, 12
- FERRIS, Ziba**
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- ***FERUSSAC, A. E.**
Books, (1835), **III**, 417
- FESSENDEN, Thomas Green** [1771-1837]
Books, (1823), **III**, 391, (see NEW ENGLAND FARMER), (1828), 400,
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- FEUCHTWANGER, Lewis** [1805-1876]
Amer. Phil. Soc. (1769), **II**, 23
Amer. J. Sc. (1818), **II**, 314, 316, 319
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Amer. Assoc. Adv. Sc. (1848), **III**, 57
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- FIELD, Martin** [1774-1834]
Amer. J. Sc. (1818), **II**, 296, (see TAYLOR), 305
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- FIELD, Roswell**
Amer. J. Sc. (1818), **II**, 376
Amer. Assoc. Adv. Sc. (1848), **III**, 80
- FILSON, John** [1747?-1788]
Books, (1784), **III**, 353
- ***FINCH, John** [-1835]
Phila. Acad. Nat. Sc. (1812), **II**, 150
N. Y. Lyc. Nat. Hist. (1817), **II**, 263
Amer. J. Sc. (1818), **II**, 294 (2), 296, 300 (2), 305, 307, 310
N. Y. Med. & Phys. J. (1822), **II**, 415
Books, (1833), **III**, 411
- FINDLAY, James**
Western Mus. Soc. (1818), **II**, 391
- FINLEY, James E. B.**
Lit. & Phil. S. C. (1813), **II**, 219
- FISCHER, Friedrich Ernst Ludwig** [1782-1854]
Books, (1837), **III**, 422
- FISHER, A. M.**
Amer. Geol. Soc. (1819), **II**, 392
- FISHER, G. J.**
Phil. Acad. Nat. Sc. (1812), **II**, 196
- FISHER, James C.**
Phila. Acad. Nat. Sc. (1812), **II**, 139, 171, 194
- FISHER, T.**
Phila. Acad. Nat. Sc. (1812), **II**, 136
- FISK, C. B.**
Books, (1855), **III**, 472
- FISK, James L.**
Books, (1864), **III**, 491
- FISKE, Oliver**
Amer. Acad. A. & Sc. (1780), **II**, 44
- FITCH, Asa** [1809-1879]
N. Y. State Agric. Soc. (1832), **II**, 543, 544 (4), 545 (5), 546 (9)
Nat. Hist. Surv. N. Y. (1836), **II**, 608, 617, (see pt. 5)
N. Y. St. Cab. Nat. Hist. (1843), **II**, 720, 721
Amer. Quart. J. Agric. & Sc. (1845), **III**, 2, 3, 4 (3)
- FITCH, Augustus**
Books, (1854), **III**, 469
- FITCH, Eleazar T.**
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- FITCH, George W.**
Books, (1855), **III**, 472
- FITZPATRICK, Thomas**
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- FLAGG, Henry Collins**
Amer. Phil. Soc. (1769), **II**, 11
- FLAGG, Wilson** [1805-1884]
Mag. Hort. & Bot. (1835), **II**, 581 (4), 582 (7), 583 (15), 584 (11),
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Books, (1857), **III**, 477
- FLINT, Charles L.** [1824-1889]
Zool. & Bot. Surv. Mass. (1837), **II**, 649, (see HARRIS)
- FLINT, James**
Western Quart. Reporter Med. Surg. & Nat. Sc. (1822), **II**, 416
- FLINT, Joshua B.**
Bost. Soc. Nat. Hist. (1830), **II**, 462
- FLINT, Timothy**
Books, (1828), **III**, 400, (1833), 411
- FLOYD, Charles**
Lewis & Clark Exped. (1804), **II**, 99
- FLOYD, William W.**
Books, (1835), **III**, 417
- FOGG, Benjamin F.**
Maine Geol. Surv. (1836), **II**, 601, 605
Portland Soc. Nat. Hist. (1843), **II**, 728, 729
- FOLSOM, George** [1802-1869]
Amer. Ethnol. Soc. (1842), **II**, 706
- FOOT, Lyman**
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- FOOTE, Charles A.**
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- FOOTE, John P.**
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- FORCE, Peter**
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- FORD, H. A.**
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- FORD, William Hutson**
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- FOREMAN, Edward R.** [1808-1885]
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- FORMAN, Joshua**
Amer. J. Sc. (1818), **II**, 310
- FORSHEY, Caleb Goldsmith** [1812-1881]
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- FORSTER, A. M.**
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- *FORSTER, Johann Reinold** [1729-1798]
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- FORSYTH, G. C.**
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- FORSYTH, J. B.**
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- FOSTER, A.**
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- FOSTER, G. G.**
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- FOSTER, J. S.**
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- FOSTER, John Wells** [1815-1873]
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- FOTHERGILL, Anthony**
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- FOULIS, Robert**
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- FOULKE, William Parker** [1816-1868]
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- FOWLE, William B.**
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- FOWLER, A.**
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- FOWLER, Asa**
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- FOWLER, David**
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- FOWLER, Samuel**
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- FOX, Charles** [1815-1854]
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- *FOX, Charles**
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- *FOX, Robert Ware**
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- FRALEY, Frederick**
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- *FRAME, Richard**
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- FRAMPTON, Lingard Aitken** [1813-1885]
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- FRANCIS, John Wakefield** [1789-1861]
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- FRANKLIN, Benjamin** [1706-1790]
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- FRANKLIN, W. B.**
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- FRAZER, John Fries** [1812-1872]
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- FREEDLEY, Samuel**
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- FREEMAN, E.**
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- FREEMAN, H. C.**
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- FREER, James W.**
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- FREMONT, John Charles** [1813-1890]
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- FRENCH, Samuel Gibbs**
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- FRICK, George**
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- FRIEDMAN, J.**
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- FRISBRE, J. H.**
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- FROEBEL, Julius**
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- FROST, Charles Christopher** [1805-1880]
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- FULLER, Charles B.**
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- GABB, William More** [1839-1878]
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- GALBRAITH, John E.**
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- GALE, Leonard Dunnell** [1800-1883]
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- Amer. Assoc. Geol. & Nat. (1840), **II**, 697
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- GALLATIN, Albert R.** [1761-1849]
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- GALT, Dr.**
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- GAMBEL, William** [1821-1849]
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- GAMBOLD, Mrs.**
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- GARDEN, Alexander** [1728-1792]
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- GARDINER, John**
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- GARDINER, O. C.**
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- GARDNER, D. P.**
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- GARDNER, Thomas**
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- GARIN, M.**
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- GARLICK, Theodatus** [1805-1884]
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- GARRETT, T. H.**
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- GAY, Martin** [1803-1849]
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- GAYLORD, Reuben**
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- GAYLORD, Willis**
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- GEDDES, George**
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- GEDDES, James**
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- GEDDINGS, Eli** [1799-1878]
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- GENTH, Frederick Augustus** [1820-1893]
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- GESNER, William**
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- *GEYER, Charles Andreas** [1809-1853]
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- GIBBES, Lewis Reeve** [1810-1894]
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- GIBBES, Robert Wilson** [1809-1866]
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- GIBBON, Lardner**
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- GIBBONS, Henry** [1808-1884]
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- GIBBONS, William** [1781-1845]
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- GIBBONS, William Peters** [1812-1897]
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- GIBBS, George** [1776-1833]
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- GIBBS, George** [1815-1873]
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- GIBBS, Oliver Wolcott** [1822-1908]
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- GIBSON, John Banister** [1780-1853]
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- GILBERT, E. W.**
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- GILBERT, W. D.**
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- GILL, Theodore Nicholas** [1837-1914]
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- GILLISS, James Melville** [1811-1865]
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- GILMAN, C. R.**
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- GILPIN, John**
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- GILPIN, Thomas** [-1853]
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- GILPIN, W.**
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- GIPPERICH, Frederick**
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- GIRARD, Charles** [1822-1889]
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- GIRARDIN, Lewis Hue** [1771-1825]
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- GIRAUD, Jacob P., Jr.**, [1812-1870]
N. Y. Lyc. Nat. Hist. (1817), **II**, 239, 266
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- GITHENS, W. H.**
Illinois Nat. Hist. Soc. (1858), **III**, 279
- GLENNY, William H.**
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- GLIDDON, George Robins** [1809-1857]
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- GLOVER, Thomas**
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- GLOVER, Thomas W.**
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- GLOVER, Townend** [1813-1883]
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- *GOBINEAU, Joseph Arthur, Comte de** [1816-1882]
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- GODDARD, Paul Beck**
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- GODMAN, John Davidson** [1794-1830]
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- GODON, Silvain**
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- GOLD, T. S.**
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- *GOLDIE, John** [1793-1886]
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- GOOD, John Mason**
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- GOOD, Peter P.**
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- GOODALE, George Lincoln** [1839-1923]
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- GOODALE, Stephen Lincoln** [1815-1897]
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- GOODELL, Abner C. Jr.**
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- GOODRICH, Chauncey H.**
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- GOODRICH, Joseph**
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- GOODRICH, Samuel Griswold** [1793-1860]
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- GORDON, Alexander**
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- GORHAM, John**
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- *GOSSE, Philip Henry** [1810-1888]
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- GOULD, Augustus Addison** [1805-1866]
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- LINCOLN, Mrs. Almira Hart (Phelps)** [1793-1884]
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- LINCOLN, Benjamin** [1733-1810]
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- LOBB, William** [1809-1863]
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- McEUEEN, Thomas**
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- RAFINESQUE-SCHMALTZ, Constantine Samuel** [1783-1840]
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- TALBOT, Theodore**
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JILLSON, (3), 1924, (Explor. Miss Valley, 1540-1840)

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WRIGHT, 1923, (Aids to Geographical research)

ZOOL. SOC. LONDON, 1902, (Cat. Library)

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GAGER, (3), 1922, (Hist. Parmentier's Garden)

CALIFORNIA.

GRINNELL, J., (2), 1924, (Bib. Ornith.)

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PENHALLOW, 1887, (Hist. Bot.), see v. 1, p. 78.

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GEORGIA.

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GERMANTOWN, Pa.

JELLETT, 1914, (Hist. Gardens & Gardeners)

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See also CHICAGO.

INDIANA.

CUMINGS, 1922, (Bib. Pal. & Stratigraphy)

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MISSISSIPPI VALLEY.

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MISSOURI.

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NEW MADRID, MISSOURI.

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BAKER, R. P., 1924, (Rensselaer Poly. Inst.)

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SCIENCE (1819)

According to S. E. Dwight, in the *Amer. J. Sc.* v. 10, p. 372, 1826, there was founded in 1819, at Hudson, N. Y., the Hudson Association for Improvement in Science. Its active stimulator and instigator was Amos Eaton, the famous Naturalist, who was at that period delivering lectures on Natural History in the various towns along the Hudson River. Its first president was Austin Abbot. Very little is known of the subsequent history of the Institution.

ERRATA & ADDENDA

IN VOLUME I

- p. 54, 9th line from bottom, should read 1897, **not** 1847.
- p. 77, PALMER, Theodore Sherman, **not** as printed.
- p. 90, Reference under TEDDER is to the *Encyclopaedia Britannica*, 11th-12th edition.
- p. 158, AKERLY, **not** Akerley.
- p. 163, BARRATT, **not** Barrett.
- p. 164, under BECK, L. C., 1870: should read Albany Inst. Trans. **not** Proc.
- p. 165, BERLANDIER, Jean Louis, **not** as printed.
- p. 167, BRACKENBRIDGE, William Dunlop.
- p. 168, BRINCKLE, William Draper, should read 1798-1862.
- p. 171, CHAPMAN, Alvan Wentworth, **not** Alvin W. C.
- p. 175, COZZENS, Issachar, Jr., **not** as printed.
- p. 177, under DARLINGTON, William:
 1863 Amer. Phil. Soc. Proc. v. 9, p. 330-42, **not** 330-43.
 1886 Minn. Acad. Nat. Sc. Bull. v. 3, no. 13, **not** v. 13.
- p. 179, DOUGLASS, David Bates, **not** as printed.
- p. 182, under ENGLEMAN: 1884: PARRY.
 Should read Davenport Acad. Sc. Proc. v. 4, **not** v. 14.
- p. 183, FLINT, Charles Louis, **not** as printed.
- p. 187, GLOVER, Townend, **not** Townsend.
- p. 190, HALDEMAN, Samuel Stehman, **not** Stedman.
- p. 192, *HAERTWEG, Carl Theodor, **not** as printed.
- p. 198, line following JAMES, Edwin, should read, Albany Inst. Trans., **not** Proc.
- p. 202, 4th line from bottom, should read SOUDDER, N. P., **not** S. H.
- p. 207, 6th line from top, should read BLANKENSHIP.
- p. 208, dates following MACBRIDE, J., should read 1784-1817.
- p. 212, *MICHAUX, François André, **not** as printed.
 The reference under 1859 should read p. 222-27.
- p. 219, PIKE, Nicolas, **not** as printed.
- p. 220, *POEY Y Aloy, Felipe, **not** as printed.
- p. 221, PRESCOTT, William. 1788-1875, **not** as printed.
- p. 224, line following RICH, O., should read, Wash. Acad. Sc. Jour.
- p. 224, line beginning with RIDDEL, should read RIDDELL.
- p. 224, dates following RILEY, C. V., should read 1843-1895.
- p. 226, to line following RUSSELL, J. L., should be added p. 106-8. 1874.
- p. 227, first line, should read SARTWELL, Henry Parker.
- p. 228, under SCHWEINITZ, L. D., de, line beginning with 1902: should read Plant World, **not** Pittonia.
- p. 229, SHEPARD, C. U., **not** as printed.
- p. 230, SMITH, Aubrey Henry, **not** as printed.
- p. 236, VAN RENSSELAER, Stephen, **not** as printed.
- p. 242, WISTAR, Caspar, first reference should read 1818, **not** 1918.
- p. 243, WOOD, Horatio Curtis, **not** as printed.

IN VOLUME II

- preface, p. xii, date should read 1839, not 1830 as printed.
- p. 28, 15th line from top, should read HORNER, W. E.
- p. 29, 1845: LEA, I., 4th line should read 1834, not 1843.
- p. 31, 10th line from top, should read WETHERILL, C. M.
- p. 43, 15th line from top, should read, DROWNE, Solomon.
- p. 48, 6th line from top, should read BURNETT, W. I.
- p. 52, 7th line from top, should read *ANDERSSON, N. J.
- p. 53, 6th line from bottom, should read *MUNRO, William.
- p. 76, should read MITCHILL, S. L., not as printed.
- p. 136, 4th line from bottom, should read SHEPARD, C. U.
- p. 159, 21st line from bottom, should read PHILLIPS, J. S.
- p. 165, 17th line from bottom, should read PEASE, W. H.
- p. 197, 14th line from bottom, should read BORDA, Eugene.
- p. 199, 22d line from top, SIMPSON, name should be spelled ENGELMANN.
- p. 241, under 1864: should read LYCEUM OF NAT. HIST. OF N. Y., instead of
 ————— (dash), as under 1848 above. This also applies to entry
 under 1870.
- p. 284, 16th line from bottom, should read OLMSTED, D.
- p. 295, 9th line from top, should read SHEPARD, C. U.
- p. 296, 17th line from bottom, should read SHEPARD, C. U.
- p. 298, 1st line from top, should read SHEPARD, C. U.
- p. 298, 2d line from top, should read TAYLOR, Steuben.
- p. 299, 4th line from top, should read SHEPARD, C. U.
- p. 300, 8th line from top, should read WILLIAMS, S. C.
- p. 302, 2d line from bottom, should read SHEPARD, C. U.
- p. 303, 1st line from top, should read SHEPARD, C. U.
- p. 303, 8th line from bottom, should read MEADE, William.
- p. 304, 20th line from bottom should read SHEPARD, C. U.
- p. 305, 3d line from top, should read SHEPARD, C. U.
- p. 305, 11th line from top, should read VAN RENSSELAER, J.
- p. 307, 2d line from bottom, should read STEELE, J. H.
- p. 307, 12th line from bottom, should read SHEPARD, C. U.
- p. 308, 14th line from top & 12th from bottom, should read SHEPARD, C. U.
- p. 309, 4th & 14th line from top, & 12th line from bottom, should read SHEPARD,
 C. U.
- p. 310, 3rd line from bottom, should read SHEPARD, C. U.
- p. 312, 10th line from top & 8th from bottom, should read SHEPARD, C. U.
- p. 314, 4th line from bottom, should read SHEPARD, C. U.
- p. 315, 8th line from top, should read I. B. CRAWE.
- p. 316, 3rd, 9th, 10th and 21st lines from bottom, should read SHEPARD, C. U.
- p. 319, 7th line from top, should read SHEPARD, C. U.
- p. 320, 4th & 19th lines from bottom, should read SHEPARD, C. U.
- p. 321, 1st line from top, should read SHEPARD, C. U.
- p. 322, 9th & 25th lines from top, should read SHEPARD, C. U.
- p. 323, 1st line from top & 11th from bottom, should read SHEPARD, C. U.
- p. 324, 13th line from top, should read SHEPARD, C. U.

- p. 326, 12th & 19th line from top, should read SHEPARD, C. U.
p. 327, 6th line from top, should read SHEPARD, C. U.
p. 328, 13th line from top, should read SHEPARD, C. U.
p. 329, 15th line from top, should read SHEPARD, C. U.
p. 330, 1st line from top, should read SHEPARD, C. U.
p. 336, 4th line from top, should read SHEPARD, C. U.
p. 339, 11th line from top, should read JAMES, U. P.
p. 340, 16th line from top & 14th from bottom, should read SHEPARD, C. U.
p. 343, 20th line from top, should read SHEPARD, C. U.
p. 344, 7th & 12th lines from top, should read SHEPARD, C. U.
p. 344, 9th line from bottom, should read DICKESON.
p. 346, 11th line from the bottom, should read SHEPARD, C. U.
p. 347, 2d line from top, should read SHEPARD, C. U.
p. 348, 10th line from bottom, should read SHEPARD, C. U.
p. 352, 6th line from top, should read SHEPARD, C. U.
p. 356, 13th line from bottom, should read SHEPARD, C. U.
p. 359, 19th line from top, should read SHEPARD, C. U.
p. 361, 18th line from bottom, should read SHEPARD, C. U.
p. 362, 15th line from bottom, should read SHEPARD, C. U.
p. 365, 5th line from bottom, should read SHEPARD, C. U.
p. 366, 10th line from bottom, should read SHEPARD, C. U.
p. 369, 2d & 15th lines from bottom, should read SHEPARD, C. U.
p. 370, line following 1858: should read HARTMAN, W. D.
p. 372, 3d line from bottom, should read SHEPARD, C. U.
p. 375, 6th line from top, should read SHEPARD, C. U.
p. 376, 6th line from bottom, should read SHEPARD, C. U.
p. 378, 16th line from top, should read SHEPARD, C. U.
p. 385, 11th line from top, should read SHEPARD, C. U.
p. 386, 10th line from bottom, should read SHEPARD, C. U.
p. 387, 19th line from bottom, should read SHEPARD, C. U.
p. 407, 3d line from top, should read Owen MASON.
p. 408, 13th line from bottom, should read SHEPARD, C. U.
p. 410, 16th line from top, should read SHEPARD, C. U.
p. 411, 16th line from top, should read SHEPARD, C. U.
p. 419, 19th line from top, should read SHEPARD, C. U.
p. 431, 5th line from top, should read James R. WILLSON.
p. 435, 19th line from top, should read TRACEY, J. G.
p. 440, 4th line from top, should read GIBBES, L. R.
p. 440, 11th line from top, should read SHEPARD, C. U.
p. 495, 18th line from top, should read TESCHEMACHER.
p. 499, 11th line from top, should read C. A. BARRY.
p. 507, 15th line from bottom, should read ROGERS, W. B.
p. 549, date in the Running Title should read (1833).
p. 564, 16th line from top, should read SHEPARD, C. U.
p. 565, 5th line from top, should read SHEPARD, C. U.
p. 565, 22d line from top, should read DANA, J. D. & WHELFLEY, J. D.
p. 566, 8th & 9th lines from bottom, should read SHEPARD, C. U.
p. 567, 6th & 7th lines from top, should read SHEPARD, C. U.

- p. 568, 2d & 13th lines from top, should read SHEPARD, C. U.
 p. 570, first line under History, should read P. B. HOVEY, Jr.
 p. 587, NATURAL HISTORY SOCIETY OF HARTFORD.

See article by T. W. HARRIS.

Reprinted in Amer. Ent. Soc. Trans. v. 44, p. 251-61. 1918. (Ed. by G. M. Greene.)

- p. 656, to 1838: REYNOLDS, add 151 p. From the N. Y. Times of July, Aug. & Sept. 1837 & N. Y. Courier & Enquirer of Dec.-Jan., 1837-38.
 p. 662, under v. 8, CASSIN, add Original edition: Mamalogy and Ornithology . . . Phala. Printed by C. Sherman & Son, 1858. viii, 466 p. illus. 32½ x 24 cm. Atlas, 2 p, l., 53 col. pl. 56½ x 37 cm. Lippincott ed noted
 p. 662 was rept. from preceding.
 p. 671, 10th line from bottom, should read W. S. SULLIVANT.
 p. 693, 16th line from bottom should read SHEPARD, C. U.
 p. 694, 3rd line from top & 2d from bottom, should read SHEPARD, C. U.
 p. 694, 10th line from bottom, should read DICKESON.
 p. 695, 16th line from top, should read DICKESON.
 p. 696, 11th line from bottom, should read DICKESON.
 p. 704, Running title should be: Nat. Hist. Soc. of Geneva College (1840), not Northern Acad. of Arts & Sciences (1841).
 p. 718, 11th line from bottom, should read MORGAN, L. H.

IN VOLUME III

- p. 30, CULBERTSON, Thomas, should read Thaddeus A.
 p. 62, 5th line from bottom, should read WEBBER.
 p. 90, 8th line from top, should read BUTTRICK.
 p. 180, 12th line from bottom, should read, DICKESON.
 p. 195, Running Title should read Pacific.
 p. 197, 15th line from bottom, should read BERLANDIERE.
 p. 237, 10th line from bottom, should read WYTHE.
 p. 256, 9th line from top, should read Docs.
 p. 286, 3rd line from bottom, should read Svante PALM.
 p. 286, 4th line from bottom, should read A. R. ROESSLER.
 p. 287, 14th line from bottom, should read ser. 3, v. 33, p. 73-5.
 p. 288, 21st line from the bottom, should read A. R. ROESSLER.
 p. 298, 1st line at top should read REAKIRT, Tryon.
 p. 415, 14th line from top, should read, James, Kay, Jr., & Co., 1834.
 p. 424, 11th line from bottom, date should read 1838, not 1836.
 p. 467, 4th line from bottom, date should read 1853, not 1851.
 p. 487, 10th line from top, should read VEATCH, J. A.
 p. 560, DANA, J. D., under Amer. Assoc. Adv. Sc. (1848), p. 62, not 61.
 p. 563, DEMBITZ, page 138, not 137.
 p. 578, GARLICK, T., page 7 (2) should read 8 (2).
 p. 580, GIBBS, George, 11th line from top, page 278 not 277.
 p. 581, GIRARD, C., under Marcy's Explor. Red River (1852), p. 146 should read 145 (BAIRD).
 p. 587, HALLMAN, page no. should read 138.
 p. 605, JENKINS, T. E., page 137 should read 138.

LIBRARIES OTHER THAN THOSE IN THE U. S. WHERE THIS WORK MAY BE CONSULTED

For the convenience of students in countries other than the United States a list of libraries in foreign countries where this work may be consulted is appended. This list is as complete as records permit.

ARGENTINE REPUBLIC.

Buenos Aires. Museo Nacional de Historia Natural.

AUSTRALIA.

Adelaide. University of Adelaide.

BELGIUM.

Brussels. Institute of Bibliography (?).

CANADA.

Kingston. Queen's University.

London. University of Western Ontario.

Montreal. University of Montreal.

McGill University.

Ottawa. Canadian Geological Survey.

Toronto. University of Toronto.

Winnipeg. University of Manitoba.

CHINA.

Peking. Metropolitan Library.

DENMARK.

Copenhagen. University of Copenhagen.

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Birmingham. Public Library.

Hull. Hull Museum.

London. British Museum.

British Museum of Natural History.

Science Museum.

Manchester. Public Libraries.

FRANCE.

Paris. American Library.

GERMANY.

Berlin. University of Berlin.

Staats-Bibliothek.

Free State Library of Prussia.

Dresden. Sachsische Landesbibliothek.

Frankfurt-am-Main. Senckenbergische Bibliothek.

Leipzig. University of Leipzig.

Borsenvereins der Deutschen Buchhandler.

Munich. Bayerische Staats-bibliothek.

Nurnberg. Stadts-Bibliothek.

HAWAII.

Honolulu. Experiment Station. Hawaiian Sugar Planter's Association.

Bernice P. Bishop Museum.

ITALY.

Rome. International Institute of Agriculture.

JAPAN.

Kyoto. Imperial University.

Tokyo. Imperial University.

MEXICO.

Mexico City. Estudios Biologicos.

NORWAY.

Oslo. University of Oslo. Botanical Museum.

PALESTINE.

Jerusalem. Hebrew University.

POLAND.

Poznan. University of Poznan.

PORTO RICO.

Rio Piedras. University of Porto Rico.

ROUMANIA.

Cernauti. University of Cernauti.

RUSSIA.

Leningrad. Academy of Sciences.

State Library.

Moscow. All-Union Lenin Memorial Library.

SCOTLAND.

Edinburgh. Royal Scottish Museum.

Glasgow. University of Glasgow.

SPAIN.

Madrid. Junta Para Ampliacion de Estudios.

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Goteborg. Public Library.

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